THIS WEEK IN THE
IRON AGE

Vol. 158, No. 18 October 31, 1946

Editorial

For Sale—Golden Rule, Somewhat Tarnished 33

o o o

Technical Articles

So You're Designing a New Product 36
New Books 40
How To Select the Correct Grinding Wheel 41
Processing 4 Pct High-Purity Aluminum Alloy 45
A Practical Method of Specifying Cast Irons (Part III) 46
Melting and Casting Combined in One Unit 49
Separating Small Parts 49
Effect of Tempering on Mechanical Properties 50
New Mill Motors Feature Higher Ratings 55
Extruded Magnesium Tubing Specifications 55
Automatic Press Feeder Prevents Accidents 56
Inert-Arc Welding 57
New Equipment 59

o o o

Features

Newsfront 35
Assembly Line 64
Washington 68
West Coast 72
European Letter 76
Personals and Obituaries 80
Dear Editor 84
Industrial News Summary 86
News of Industry 89
Gallup Polls 95
London Economist 103

o o o

News and Markets

Brass Mill Output at New High 89
Hungarian Steel May Be Exported 91
Cost Savings Plan Pays Dividends 92
USES Sees Employment Trends Unchanged 100
British Steel Output Rises 101
Industrial Briefs 106
New Construction 107
Machine Tool Development 108
Nonferrous Market News and Prices 110-11
Iron and Steel Scrap News and Prices 112-13
Comparison of Prices by Week and Year 114
Finished and Semifinished Steel Prices 116
Alloy Steel Prices 117
Fabricated Steel Production Prices 118
Warehouse Steel and Pig Iron Prices 119
Ferroalloy Prices 120
British Steel Board Modernization Plan 121
Analyzes Pittsburgh's Future 124
Committee Endorses Wire Nail Subsidy 125

o o o

Index to Advertisers 165-66

J. H. VAN DEVENTER
President and Editorial Director
C. S. BAUR
Vice-President & General Manager
R. M. GIBBS
Assistant to President
H. E. LEONARD
Assistant General Manager
B. H. HAYES
Advertising Manager
O. L. JOHNSON
Manager Market Research
C. T. POST
Manager Reader Service
R. E. BAUR, Production Manager
C. E. ELLIS, Promotion and Research

o o o

Executive Offices
Chestnut and 56th Sts.
Philadelphia 39, Pa., U.S.A.
Editorial and Advertising Offices
100 E. 42nd St., New York 17, N.Y., U.S.A.

o o o

Regional Business Managers

FRED BANNISTER
W. Hartford 7, Conn.
62 La Salle Road

ROBERT F. BLAIR
Cleveland 14
1016 Guardian Bldg.

C. H. OBER
H. E. LEONARD
New York 17
100 East 42nd St.

PEIRCE LEWIS
Detroit 2
7310 Woodward Ave.

B. L. HERMAN
Philadelphia 39
Chilton Bldg.

H. K. HOTTENSTEIN
Chicago 3
1134 Otis Bldg.

JOHN M. HUGGETT
Pittsburgh 22
814 Park Bldg.

R. RAYMOND KAY
Los Angeles 28
2420 Cheremoya Ave.

o o o

Owned and Published by
CHILTON COMPANY
(Incorporated)

OFFICERS AND DIRECTORS
JOS. S. HILDRETH, *President*
EVERIT B. TERHUNE Vice-President
J. H. VAN DEVENTER Vice-President
C. S. BAUR Vice-President
P. M. FAHRENDORF Vice-President
JULIAN CHASE Vice-President
WILLIAM A. BARBER, Treasurer
JOHN BLAIR MOFFETT, Secretary
G. C. BUZBY HARRY V. DUFFY
THOMAS L. KANE CHARLES J. HEALE

o o o

WILLIAM H. VALLAR, Asst. Treas.

o o o

Chilton Editorial Board
PAUL WOOTON
Washington Representative

o o o

Member, Audit Bureau of Circulations

Member, Associated Business Papers

o o o

Indexed in the Industrial Arts Index. Published every Thursday. Subscription Price North America, South America and U. S. Possessions, $8; Foreign, $15 per year. Single Copy, 35¢. Annual Review Number, $2.00.

o o o

Cable Address, "Ironage" N. Y.

o o o

Copyright, 1946, by Chilton Company (Inc.)

Here's Your Tubing

Quick Shipment from Large Ryerson Stocks

IN STOCK

Low Carbon, Cold Drawn Seamless Mechanical Tubing
Regular and Pump Cylinder Finish

High Carbon, Cold Drawn Seamless Mechanical Tubing

Structural Tubing—Hot Rolled, Butt Welded

Boiler Tubes—Seamless and Electric Resistance Welded

Allegheny Stainless Seamless Tubing—Type 304

Allegheny Stainless Seamless Pipe
Type 304—Standard and Extra Heavy Weight
Types 316 and 347 Standard Weight

Allegheny Stainless Welded Pipe
Type 304—Standard Weight

Hot Finished and Cold Drawn Alloy Steel Tubing and Aircraft Quality Tubing Available from Mill Only.

It's just what you ordered because we continually check the size-accuracy, concentricity and straightness of our tubular stocks.

Its surface is smooth and scale-free because close control over every manufacturing step, from selection of the highest grade billets, through piercing and drawing, to the finished tube, assures a top quality product.

You'll find that constant experimentation to improve machining qualities has paid off in good machinability within the limits of the analysis specified. In short, nothing is overlooked that will help you put this tubing to work as a finished part, quicker and with less waste.

Convenience is another advantage of Ryerson service on tubular products. Large, diversified stocks are on hand for prompt shipment in eleven completely equipped plants . . . providing next-door service most everywhere.

A Ryerson tubing specialist will work with you on all tubular requirements. Get in touch with the plant nearest you when you need tubing from stock.

JOSEPH T. RYERSON & SON, INC., Steel-Service Plants: Chicago, Milwaukee, Detroit, St. Louis, Cincinnati, Cleveland, Pittsburgh, Philadelphia, Buffalo, New York, Boston.

RYERSON STEEL

The
IRON AGE

ESTABLISHED 1855

o o o

October 31, 1946

o o o

J. H. VAN DEVENTER
President and Editorial Director

C. S. BAUR
Vice-President and General Manager

o o o

Editorial Staff

Editor .....T. W. LIPPERT
News Markets Editor T. C. CAMPBELL
Technical Editor.....W. A. PHAIR
Machine Tool Editor....H. E. LINSLEY

o o o

Associate Editors

F. J. WINTERS
S. H. BARMASEL
E. S. KOPECKI
G. F. SULLIVAN

Editorial Assistants

M. M. SCHIEN
H. W. VAN CAMP
C. R. MUNZER
J. P. O'CONNOR
E. L. SCHIMKO
A. J. SPEAR
R. E. BENEDETTO

Foreign Editors

Europe .....JACK R. HIGHT
49 Wellington St., Strand, London, W. C. 2, England
Canada (Contrib.)...F. SANDERSON
330 Bay St., Toronto, Canada

Regional News and Technical Editors

T. E. LLOYD
Pittsburgh 22
814 Park Bldg.

D. I. BROWN
Chicago 3
1134 Otis Bldg.

JOHN ANTHONY
Philadelphia 39
Chilton Bldg.

L. W. MOFFETT
EUGENE HARDY
KARL RANNELLS
Washington 4
National Press Bldg.

W. A. LLOYD
Cleveland 14
1016 Guardian Bldg.

W. G. PATTON
Detroit 2
7310 Woodward Ave.

OSGOOD MURDOCK
ROBERT T. REINHARDT
San Francisco 3
1355 Market St.

R. RAYMOND KAY
Los Angeles 28
2420 Cheremoya Ave.

Editorial Correspondents

ROBERT McINTOSH
Cincinnati

L. C. DEAN
Buffalo

G. FRAZAR
Boston

HUGH SHARP
Milwaukee

JOHN C. McCUNE
Birmingham

ROY EDMONDS
St. Louis

JAMES DOUGLAS
Seattle

For Sale—Golden Rule, Somewhat Tarnished

I AM informed that Aladdin bought his wonderful lamp at a bargain price at a second hand store. It was worn and shabby and nobody else wanted it. Yet it proved to have miraculous powers. All the owner did was to start polishing it up a little when he discovered that with it he could command the best of everything.

The miraculous lamp, that would summon genii and build palaces, went to the junk shop because nobody appreciated what it could do. And now I am told that the Golden Rule has met the same fate. Somewhere, but no one knows just where, is this somewhat tarnished object, waiting for a different kind of Aladdin to polish it and put it to work.

It would have to be a different kind of Aladdin to make it work. Not a selfish individualist who would confine its powers to his own enrichment, but one who loved all mankind and who wanted to serve them at a time they most needed it.

And how they need it now!

Today the slogan, at home and abroad is not the injunction: "Do unto others as you would have them do unto you." It is, with few exceptions: "Do to the other fellow what you think he will do to you if you don't do it first."

So we have struggle between capital and labor at home, and between country and country in the world. Struggle that not merely gets us nowhere but sets us back from getting anywhere.

Russia wants to develop the atomic bomb in time to deliver it to the United States before we decide to deliver its effect, not its secret, to Russia. Labor wants to get the upper hand of the employers before times change and the employers can get the upper hand over them. No wonder that the Golden Rule, most powerful of all talismen, is in the hockshop and tarnished from disuse.

Somebody ought to get this powerful golden object out of the hockshop, polish it up and put it to work.

How? That is the $64 question. But I note that those $64 questions are sometimes correctly answered, even without the help of the MC.

What does the Golden Rule mean? Surely it must mean the most good for the most people. On that basis it just as surely does not mean communism, because that as far as it has gone, has meant the most good for those in power and very little good for those who are not. Nor does it mean state socialism which means, invariably, as does fascism, a good restricted to the governing classes.

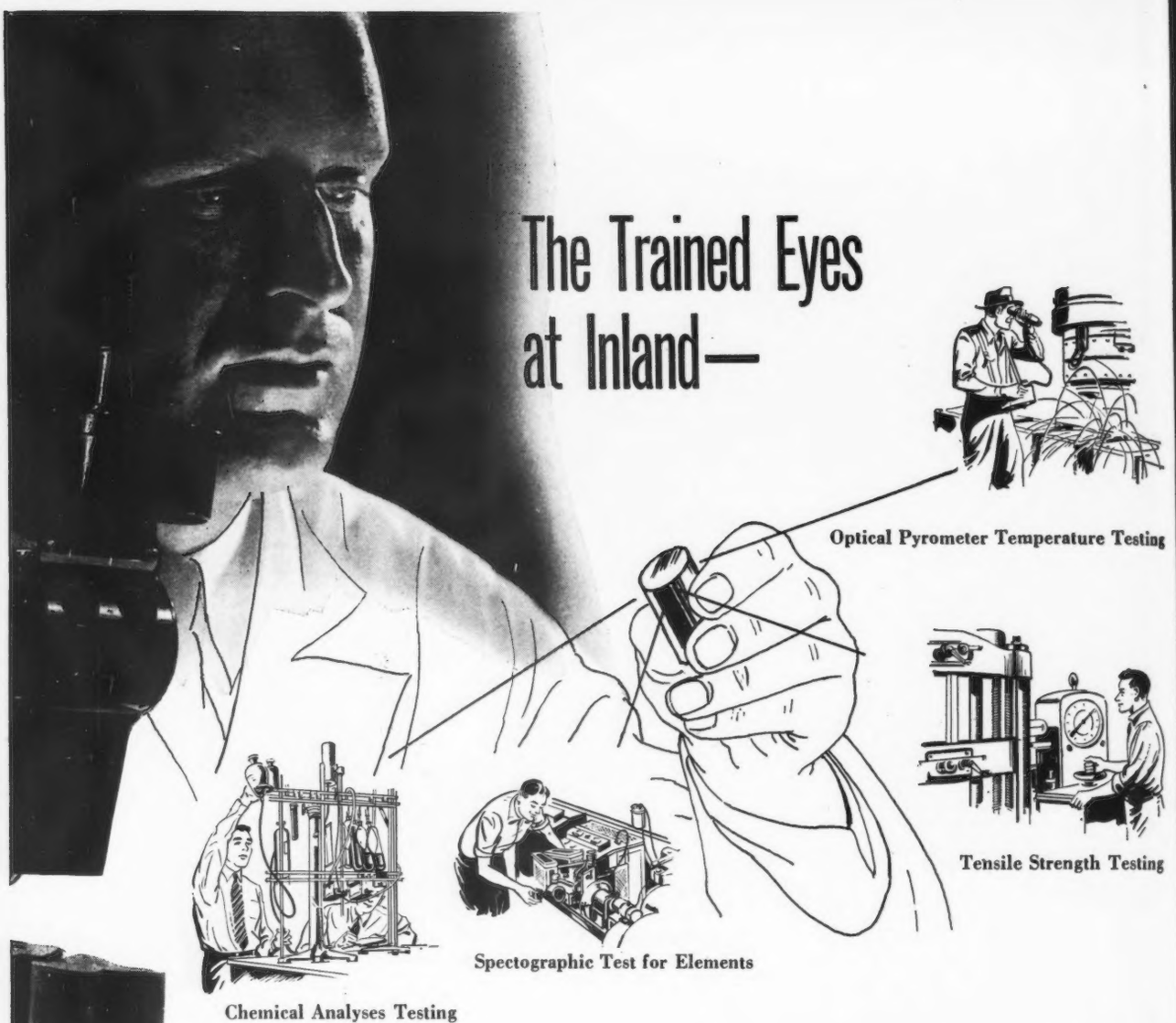
Similarly, in a democracy, such as ours, it does not mean the most good for the employer and the least good for the employed, or vice-versa.

I cannot imagine any atmosphere more conducive to the real and honest application of the Golden Rule than that in the United States, provided we air-condition that atmosphere a bit to remove the occasional bad odors. And if we could do that, I am willing to risk the prediction that each and every one of us could increase our material well being 50 percent and our social and spiritual well being by an infinite factor.

I like to think of the practical application of the Golden Rule, at least in our own field of business and industry in terms of Paul Hoffman's No. 1 economic precept, namely that: "What's best for everybody is best for business." And we are all in business, including the consumer.

If we could apply this philosophy universally, the Golden Rule would soon be out of hock.

The Trained Eyes at Inland—



Optical Pyrometer Temperature Testing

Tensile Strength Testing

Spectographic Test for Elements

Chemical Analyses Testing

Every day, year in and year out, ton after ton of steel passes the scrutiny of Inland's "trained eyes" . . . Samples are gathered from all operations and subjected to exacting tests before the steel is permitted to be rolled into final form.

Chemical analysis maintains a careful control over all elements . . . holds them in proper proportion and within rigid tolerances. Further control is possible by means of the spectograph and the comparator, that present a graphic record of the exact composition. Optical Pyrometers eliminate guesswork . . . allow operators to control temperatures accurately at all times. In addition, tensile, hardness and metallographic tests are conducted to maintain satisfactory properties. The combined control exerted by these tests is assurance of the quality fabricators can expect . . . and get from Inland Steels.

Inland steelmakers working together closely, carefully on each individual order means *that* order will "measure up" to every requirement when delivered.

Inland Steel Company, 38 S. Dearborn St., Chicago 3, Illinois. Sales Offices: Cincinnati, Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul.

PRINCIPAL PRODUCTS: BARS
STRUCTURALS • PLATES • SHEETS
STRIP • TIN PLATE • FLOOR PLATE
PILING • REINFORCING BARS • RAILS
TRACK ACCESSORIES

INLAND STEEL

NEWSFRONT

► Many large industrial firms have been trimming expenses for the past few months but there is no indication that a depression is feared--the cuts reflect a trimming down of careless wartime spending habits. Shortage of materials is forcing deferment of expansion plans over a longer period of time.

► A persistent rumor in Detroit is that the 12-cylinder Lincoln will be dropped in favor of 8-cylinder models and that the Ford V-8 will be replaced by a six. Current drive to cut auto costs lends credence to this old Ford rumor.

► A drive to unionize white-collar steel workers may be in the making if USWA-CIO collection of data on these employees means anything.

► The Federal Government is preparing to distribute microfilm Technical Intelligence reports on 1500 I. G. Farben chemical processes to libraries in six industrial cities. Here they will be available for review or photostating. A catalog and abstract service will accompany the films.

► Cold working accelerates the rate of aging to a degree determined by the amount of cold work, British investigations on high purity aluminum alloys containing 4 pct Cu indicate.

Microscopic examination of these specimens has shown that the effect of cold work on a quenched specimen is to bring about such microstructural changes as would be produced by aging at room temperature to the fully aged state.

► Induction melting and centrifugal casting can now be accomplished in a single unit developed by Alexander Saunders & Co., New York.

In this equipment which consists of an Ecco casting machine and a 10-kva high frequency converter, the metal is brought to casting temperature after which it is cast centrifugally without further handling.

► Year-end inventory taking will probably show many manufacturing inventories to be further unbalanced than they were last June as a result of increased production of many parts and basic materials. Bankers view unbalanced inventories with a jaundiced eye and more vigorous efforts to bring stocks into line can be expected early next year.

► SAE tests indicate that synthetic plastics may be used, either singly or laminated, for motor vehicle windows provided state agencies approve. But the society advised against use of plastics in windshields because none yet developed have the necessary abrasion resistance. Right now most plastics are shorter than glass.

► WAA estimates that by July 1947 it will have acquired, for disposal, some $33 billion worth of property--an amount approximating one-third of the prewar national income.

► Reports that Philip Murray will retire as active head of the CIO should be qualified--he would like to step down and devote his energies to the United Steelworkers, but will not do so until he is convinced his successor will carry on his policies so that USWA will lose none of the ground gained to date. This situation will be further clarified at the CIO convention in Atlantic City in November.

► Sunk at Pearl Harbor and subsequently raised, the 28-yr old USS Oklahoma has been put on the auction block for her 24,300 tons of scrap metal. The old ship will be auctioned Nov. 26 at the New York naval shipyard. She is afloat and available for inspection at Pearl Harbor.

► Tests conducted at the Steel Co. of Canada indicate that while use of oxygen in the openhearth holds great promise, the shortening of scrap melting time (by at least 2½ hr) requires that scrap charging be greatly accelerated to obtain advantages of the use of oxygen. It is believed that bubbling oxygen into the molten metal bath will substantially lessen refining time. Recent spot tests indicate an output increase of more than 40 pct in some cases.

► Long delayed plans for erection of a continuous strip mill in France have finally solidified in the placement of a tentative order with United Engineering & Foundry Co. for a 66-in. mill. The final order will follow when details for the formation of a new company by Denain & Anzin Steel Co. and Forges & Steelworks Co. of North and East which will own the mill.

► Thomas steel made by the Ugiperval process developed by the Valenciennes, France, works of the Forges & Steelworks Co. of North and East promises to replace the best openhearth or electric steels. For autobody sheets in particular, killed steel micrographically very clean is being produced with the following analysis: C, 0.025; S, less than 0.015; P, less than 0.02; O, less than 0.004; Ni, less than 0.008; and Mn, about 0.250.

► British European Airways has two Bristol planes on order to be equipped as flying workshops to deal with damaged or grounded planes at foreign fields.

So You're Designing A New Product!

By GEORGE K. HENDRICK
Chicago

Before making any decision concerning the addition of new products to an established line, this informal but informative article is must reading. This highly personalized evaluation, based on extensive experience in the metalworking field, on where the most productive efforts should be expended in order to increase sales, outlines the pitfalls and detours that may obstruct the path to expansion. For more fruitful results the author suggests first the improving of the old product to the point where competition approaches the vanishing point, before considering a new product.

IN this day of rapidly changing conditions there is so much for businessmen to read about business that it seems an almost hopeless task to read all that is necessary to keep well informed. It is not the intention here to propose anything new or different in principle, but rather to emphasize a few fundamentals that remain unchanged and essential. This is not intended to be critcal of business; rather call this a picture of ordinary business from the viewpoint of a hard-headed spectator.

Most men in business today can analyze the mistakes of others, including their competitors, much better than they can point out the weaknesses in their own organizations. As a matter of fact, if companies were to trade top executives for short periods interesting results might follow. We all have probably made a statement such as this, "John Henry is going to break his back on a new project, but he won't listen to reason"; or "Will Jones is going into a new venture on the same basis as we did several years ago and what a trimming he has in store for himself." At the same time the fellow making these comments is probably setting out on a program in his own business that half a dozen people could tell him wouldn't work.

Maybe the eternal urge to expand is the cause of most of the trouble. There is nothing wrong with expansion, but it is not always done in the right direction. When business is good there is not only the urge but the funds with which to expand as well. On the other hand, when business is bad most companies want to add to the regular line to fill the plant and keep the salesmen busy.

Let's take a look at the ordinary interpretation of expansion. Do we usually stick to our own knitting, the business we know the most about, and try to get increased business and profit by improving products and reducing costs so that there can be wider distribution? No, we admit that our products are probably the best of their kind. True, there are a few changes to be made to keep abreast of the day and a number of cost-reducing features to be gone into, but in general everything possible has been done with the present products. Then we look with longing eyes at other products, probably those of our competitors. Of course, being his competitors, we know the shortcomings of his products, probably as well as he knows the weaknesses of ours.

When the subject of expansion is discussed in the group running the business it is easy to be convinced that a new field is wide open. You argue that your salesmen are calling on a certain trade and they can kill two birds with one stone. (More than likely you kill one salesmen with two lines.) The salesmen know the customer, the customer likes your products, and there is no reason why he can't be sold a second bill of goods. Few executives have the fine sense of recognizing that slim dividing line of when a salesman can and can't. Strange as it may seem in most cases he can't. It is really an amazing fact that few salesmen are able to combine the sales of old line products with a new and different one, although his customer uses both. Theoretically, it always looks feasible, but practically it seldom works out. Most of us have gone through such an experience, but still the same evolution goes on every day and the same error is repeated over and over again.

How to Make Your Salesmen Nervous

In any event, the last experience with a new product is forgotten and we are off on a new tangent. The salesmen are brought in, the new line explained and they are sent back to their territories inoculated with the new germ. They go out filled with enthusiasm and concentrate on the new item. Some are sold but the fac-

tory hasn't finished the tooling up so deliveries are delayed. The salesman's item is wasted and he loses patience with the factory.

Pressure is brought to bear on the factory and it is turned inside out to meet the customer's requirements. If necessary, a few of the products are turned out by hand because the tools aren't complete. After a hasty factory test and inspection and usually, with little or no instructions, the material is shipped to the already irate customer.

The material is installed and either won't operate properly or doesn't come up to the specifications. Before long the customer is disgusted with the salesman, the factory and the whole organization. A few more sales and the sales department is in so much hot water that the old established lines are badly neglected. Sales in these departments begin to fall off. Then, if good judgment isn't used at the main office, a few salesmen are looking for new connections. By this time you are ready to let out a blast to the effect that you don't do business like that. But you do, so do we, and we won't admit it either.

If companies could only measure the loss in their plants that introducing a new product causes! Everyone adds up the cost of buildings, equipment and tools required for a new device, but they never add the hidden expenses in time consumed in digesting something new. Nor is the cost of neglecting the old line of goods ever figured. The usual theory behind the addition of a new product is that it can be done with little or no additional overhead expense. An engineer or two may be added, but as far as the factory is concerned the regular force is supposed to handle the situation.

If the average manufacturer knew the toll new products take on his entire plant, he would find that he could write off the profit on the new line forever. The cost of breaking up schedules, loss of production and general inability to take proper care of regular products would far exceed any liberal estimates. Probably the greatest loss of all is the loss of confidence which invariably develops between the various activities of a business.

Recently the chief executive of a well known company stated that his expectations of a manufacturing plant were as follows: It should turn out a good product, at a reasonable cost, on a proper schedule and, particularly, when promised to the customer. Sounds simple, but it really covers the whole running of a plant. When schedules and promises are made, they are based on the usual experience of production. When the management throws into its plans a number of new products, a whole ripple of difficulties, delays and upsets follow through from salesman to shipping department. Those who have been close to actual running of a plant realize that there are periods when everything goes haywire and the simplest shipments seem a problem.

On the other hand, there are periods (too infrequent, unfortunately) when the plant turns out unusually heavy shipments with good profit and with little apparent effort. During these most productive

The Circle

WE'VE LOST PLENTY OF MONEY ON THAT ACME JOB! WHY COULDN'T WE ENGINEER AND BUILD THAT JOB AND DO IT RIGHT!??! ★@☆!!!
THE JOB WAS SOLD BEFORE WE HAD THE ENGINEERING DONE ON IT! BESIDES, THE SHOP DIDN'T READ OUR DRAWINGS RIGHT!
WE'VE BEEN TRYING TO GET SOME OF ACME'S BUSINESS FOR YEARS, BUT NOW WE'LL NEVER GET ANOTHER PENNY OUT OF 'EM! I THINK THE SHOP LET US DOWN, TURNING OUT A PILE OF JUNK!
SERVICE DEPT.
NOBODY WROTE ANY INSTRUCTIONS! HOW DO YOU EXPECT A SERVICEMAN OR CUSTOMER TO FOLLOW INSTRUCTIONS IF THERE AREN'T ANY? THEY SHOULD HAVE BEEN WRITTEN WHEN THE THING WAS DESIGNED!
WE FOLLOWED THE DRAWINGS, SUCH AS THEY WERE.... AND YOU ONLY GAVE US 3 WEEKS TO GET THE JOB OUT! THEN THE SERVICE DEPARTMENT MESSED UP THE INSTALLATION!!
SID HIX

periods there seems to be a quiet rhythm throughout the whole organization. Many of us could afford to spend a great deal of time and research endeavoring to capture as a more permanent condition these ideal periods of smoothness in plant operation.

Too many of us feel as though we had all of our teeth pulled by the last day of the month and then act as if we were under anesthesia until the 15th of the following month. If that statement is hard to believe, look over your record of shipments for the past year and figure out the percentage of the total that leaves the plant the last week or two of the month. Then if you are a little more curious, figure out, if you can, the cost of the products shipped the last week of the month as well as the number of complaints received on these same shipments. Be sure to take into account halftime for overtime, which will be probably tucked away in an expense account. The cause of most of this trouble can be laid chiefly to the lack of an even tenor in the engineering or manufacturing departments. You are chuckling a little by now and feeling that you know the answer—careful planning. That sounds good, but all these things happen in plants where the planning is beyond criticism.

Previously it was said that one of the greatest losses was the loss of confidence throughout the whole organization. The net results seem to be that all home offices are stupid according to the salesmen and all salesmen are confounded ingrates in the eyes of the factory. Some time when you are riding in a Pullman get real close to a salesman by telling him about the troubles in your factory. You won't be able to turn him off. It is true whether he sells automobiles, electrical equipment, or turbines. Better still get a sales convention started on the subject of factory troubles.

How to Lose Customer Good Will

After you have added the losses through the sales department and factory, try to get a picture of the customer who has purchased some of your new gadgets. You may have to draw a distant mental picture because you won't be able to approach him when he finally gets his goods and gets them in operation. Good will is hard to get originally and easy to lose; even if you do carry it on your statement at one dollar. When it's gone a dollar wouldn't pay the cost of a farewell telegram. All the other losses are within your organization where you can control them somewhat. The customer is different and what's more he's a talkative individual and his experience with your equipment is rehearsed within his organization and without. To say the least, if he is well satisfied he is a good rooter, and if not the reverse is true.

Getting back to this new product and following its development a little closer, the decision is made to take on the new product. Working models or samples are made rather quickly and with some backing and filling it's about ready for the manufacturing shop. Enthusiasm over the laboratory results runs high. No one can explain the mesmerism that comes over executives, but they surely are vulnerable at this point. A rough draft of an idea goes back and forth or up and down and then we have the world by the tail. All of this on the strength of tests and checks made under the most ideal conditions in the experimental department.

Of course, no one at the present time would think of putting a product on the market without a proper seasoning in the field. That's what we all say we do, but actually in many cases it is not done. When field models are in operation they are not observed closely enough. Many times they are forgotten. Most of the time minor adjustments are made that are thought to be inconsequential but when multiplied by a thousand or ten thousand bring the skies down on your head. Let's put it that the original models are not under the most careful and minute observation during their trial period.

Who Causes the Trouble?

Another thing, the observation should be projected from the angle of the customer who may not know the why and wherefore as well as the engineer watching the field sample. The time and expense of an extra long and severe field test will pay dividends in place of losses incurred by foisting not too well tried material on the customer. If a doubting Thomas could come to the front at this point with sufficient strength to dampen the inordinate enthusiasm many headaches would be avoided.

The sales department decided, the last time they were burnt on a new product, that most of the trouble was caused by salesmen getting wind of the new development when it was in its infancy and selling it too soon. This time no salesman is going to know a thing about it until it is well aged, in production, in fact in the shipping department, all packed with printed instructions, all i's dotted and t's crossed. That's a big laugh. Try to keep your indiscretions from your distant relative in Kokomo. The news goes along the grapevine and before you know it a wire comes in with a big piece of business from a customer you have never been able to do business with. He must have the new gadget. Not only that but delivery is the essence of the contract and shipment must be made within an impossible date.

The sales manager reads the price tag on the prospective order. His resolution goes by the board and there is a quick huddle. The engineering department still has the problem. They are not fully satisfied and rather reluctant to say "go." Of course, engineers are never satisfied, are always looking for the ultimate and must be shoved off before they admit they are ready. Further, this new item has been in their hands long enough to be finished. Worn down they finally give in weakly and hope that the little kinks will be worked out as they go along.

Now we're off to the races. The factory is called into the picture at this point. Before the prints are dry enough to be carefully checked, the tools are under way. Everything is carefully planned more or less, chiefly less. With the usual changes in tools and parts, the production starts. Under the long-term plans of the factory, no room was left for the new product at this early date. The supervision begins to give more than its share of time to the new device and lets routine go. All too soon the delivery date falls due and then comes the most upsetting period in the life of any plant. A strong wire from the customer leads to another huddle in the office. A *must* order emanates although the equipment or tools aren't finished. Most of the equipment must be made by hand, and after a quick test the material is shipped with a prayer, but it's evidently to the wrong deity because it doesn't work.

The customer gets his material in the field, but it won't function properly. The trouble and expense starts. There is a general panning of the factory—

they should have known better. The final inspector needs glasses, but he already has them so he should be fired. The factory blames the engineer and the engineer blames the factory. A superservice crew leaves the factory for the customer's plant in answer to the frantic calls for help from the sales department. Money is spent, but the customer is through with the company forever.

Back in the plant at this period everything breaks loose. There is a general inquisition in an effort to place the responsibility. The engineering department gives a thousand reasons for the failure and 999 are placed at the manufacturing department's back door. Of course, the factory retaliates but in the long run the factory has to bear the brunt of the attack. This simply has to be because they make the material and are the last to see it before it goes out.

Usually on a new product that is hurried through production there are enough variations from specifications in the best regulated plants to enable a case to be built up against the production department. Most of these discrepancies may be far removed from the cause of the ultimate failure, but they give strength to the case against the manufacturing department. Other important factors in placing the blame for defective products are the loudest voice, the toughest hide, the better salesmanship and which department sticks rigidly to the truth.

Finally all too often old Jim, the factory superintendent, is on the spot. He has been pretty good in his day, but hasn't kept abreast of the times. An up-to-date shop man is needed. A man with that divine instinct through which he can infallibly tell that certain designs are wrong. It took 10 yr to get Jim to follow the engineering department's prints to the letter, but still he should have had sense enough to know that certain things won't work.

Out in the field the salesman is through selling anything new the factory turns out. Of course, salesmen are eternal optimists and in a few months they are pricking up their ears because of the new and latest grapevine rumor about some new gadgets and are ready to go through the same cycle again.

All of this may sound fantastic. You will say that this sort of thing may go on in a poorly organized business, but not in your company. Think back and examine your own record and see whether or not your experience has been the same.

By now you may be ready to blast me out of my seat on a number of counts. I don't want to be taken literally on this matter of expansion. Of course, I believe in expansion of a business but expansion in the right direction. Let's assume a going business is making a rather special product. When the urge to expand comes along, look at the regular products first to see what can be done with them. We stated above that competitors usually know each other's shortcomings. Instead of saying that Jones makes a certain product but doesn't do a good job at it and therefore leaves an open field to go to work in, let's take our competitors' picture of our goods. The trade in our particular line is not entirely satisfied with our product because there are usually some things to be done to make it all that it should be. Therefore, the customer when approached by a new man in our field lends an ear hoping that he gets a device that will give him the complete service he expects. The field is more penetrable. Then why isn't it the obvious thing for manufacturers to get down to cases and eliminate from their products the shortcomings that make them an easy mark for new competition. Why not get together from top to bottom of an organization and make the product you know the most about so good that competitors will think twice before trying to break into the ranks. If they do enter it they may find the going too tough.

It could happen to you.

Expansion Urges Need Channeling

With all the pride we have in our industry I think most manufacturers will agree that practically every product has something lacking, however minute, to make it what it should be. One of the slighted items on manufactured products today is proper instructions on handling and installing or using. Volumes could be written on this phase. Most instructions whether for an automobile, a radio, or a can of soup are lacking in some important detail. Too many instructions look like a fire insurance policy with exceptions and addenda, and are so complicated that even the company's own service men can't understand them.

During the past few years I bought two cars, a refrigerator, a radio and a few cans of beer. There were complicated diagrams of the vital parts of the automobile, but unfortunately the instructions covered a previous model. The radio called for certain tubes, a stamp corrected this to a different type, and the tubes with the shipment were an entirely different number. With the refrigerator came a tag wired to the unit with complete instructions on care and upkeep. There were several underlined cautions. Unfortunately, the card was lost within a week and with it all the cautions. My opening of the can of beer according to instructions led to redecorating the kitchen ceiling, and

a cleaning bill for my Sunday suit. Sounds foolish, but it happened to me, the customer, and even with low appraisal of my intelligence there must be millions of other customers in the same boat.

Other details, such as packing and shortages in shipments need attention. Is there anything more annoying than to read instructions calling for installation with ten 1-in. bolts and finding included in the shipment eight ½-in. size? These are minor shortcomings on equipment sent directly to the housekeeper, but the same is true of equipment shipped to industry.

Another little point is replacement parts. How often do we see a diagram with accurate part numbers sent with equipment? Live in the country for a while with a home lighting plant—try and live while you wait for a replacement part when something goes wrong. These may be minutiae, but they are points to be worked on to make your present product more salable.

The cause of all this seems to be that the time of everyone in the plant is taxed to capacity on some new project. Of course, when there is a serious complaint from the field there follows the usual investigation to place the responsibility. Quite often the management decides that a man should be brought in from the field to inculcate the plant with the requirements of the actual buyer of the product. He is brought in for a single purpose but before long he is shunted off into other work due to the rush of getting new equipment out.

Why shouldn't the engineering department in an industry know more about the practical application of the product than the field man. Why not send the engineers into the field a good share of the time so that they can follow their creations to their final destination. Theoretically they should know the reasons for all parts so that their own interpretations of field troubles should be sound. When an engineer brings a design into existence he should be able to nurse it along, correct it and keep it in the right channel.

One of the chief criticisms of designing engineers today is that they are not practical enough—they don't know enough about the range of possibility their designs will be subjected to in the field. I have seen too many engineers argue their heads off about certain equipment and then reverse themselves completely after a trip to the field. Recently I talked to a man who had built machinery for years and was so good at it that he was sent out in the service department. Mind you, he went out to service the machinery he had built himself. While he was building he heard of all kinds of trouble but he was building to the best of his ability and he couldn't improve the product. You should have heard him ride the factory after he was out about a month. When he was reminded of the fact that he was running down his own own work his answer was that if he were back in the factory again he would never let one of the machines get by the same way even if it meant their not being shipped. Why not let a few of the plant men, particularly in the engineering department, go through this experience. No, they are too busy on new things.

Concentrate on Making the Best

If manufacturers only knew what they could realize by applying all of their energies on their present products they would forget many of the new things that consume the time of their organization. It is remarkable how long it takes an organization to understand its product inside out, and it is still more remarkable what can be done with a product where there is intelligent understanding. If the experimental, engineering and manufacturing departments could concentrate on fewer products, live with them in the plant and in the field, the results in sales and profits would more than offset the addition of several new items.

Then let us use horse sense in our theory of expansion. Drain the nth degree of the possibilities out of our present product before thinking about other fields. The engineering department should know it's own product backward and forward. It should watch the trend of the market so that the product may be changed to cover a wider market. Time in the field and factory should be devoted to making the product acceptable to a broader field. Both engineers and salesmen should be on their toes for new applications for standard products. The sales departments should be well informed on all the ramifications of the goods they are selling. With this knowledge and confidence in their product, they will be better equipped to meet both customer and competition.

New Books

"Practical Designs for Drilling, Milling and Tapping Tools," by C. W. Hinman. A practical manual on the designing, drafting and use of jigs, gages, hand tools, and tapping and milling fixtures. Fully illustrated, it gives beginners all the essentials of tool design, and supplies experienced designers with many new ideas. McGraw-Hill Book Co. Inc., 330 W. 42nd Street, New York 18, 416 p. $4.50.

* * *

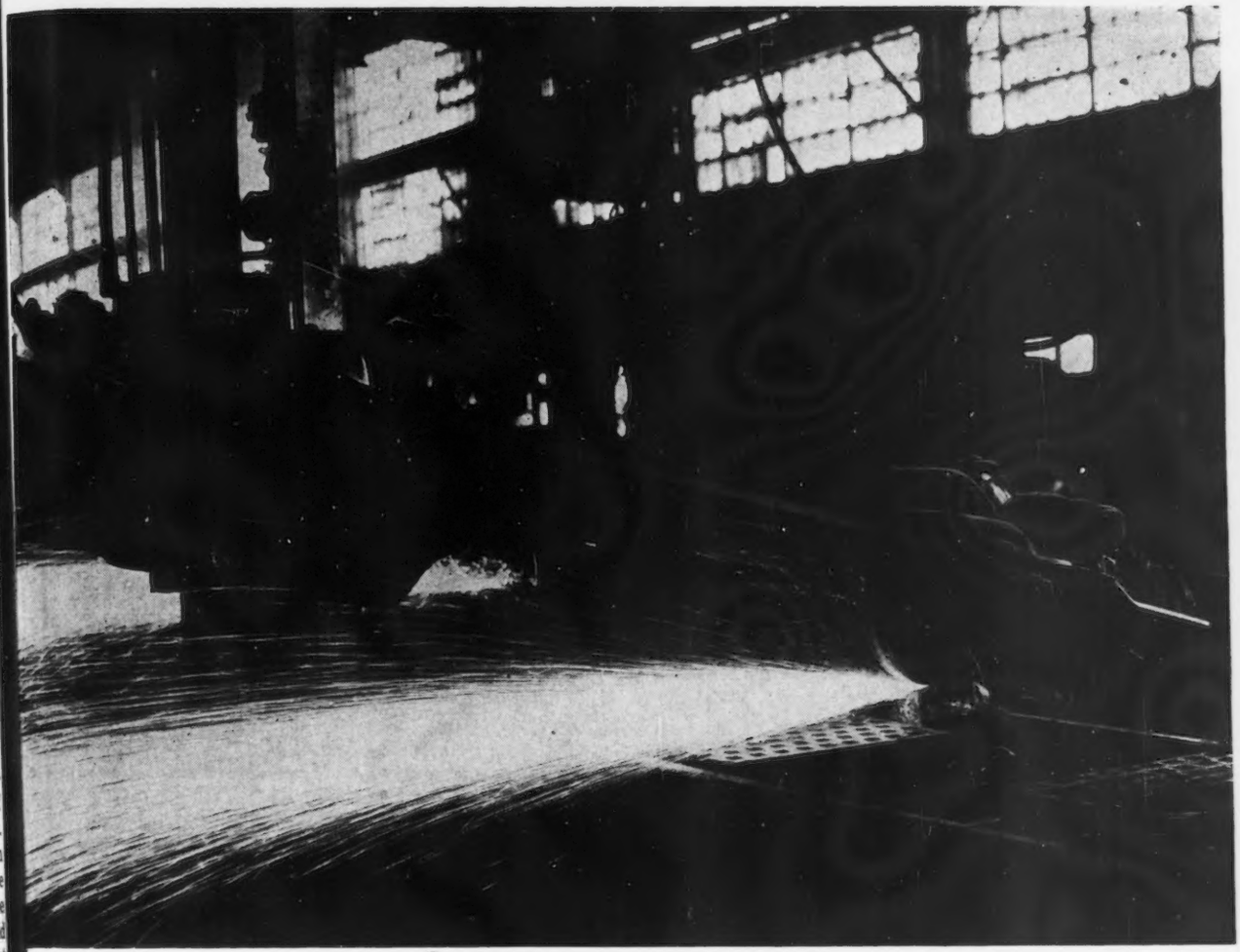
"Manual of Arc Welded Design," by LaMotte Grover. Useful, up-to-date information covering fundamentals of design, materials, inspection, estimating and engineering control of welding and related operations. Specifications are included for welded connections for all sizes of rolled beams, and a series of diagrams for rapid design of welded connections is given. Air Reduction Sales Co., Dept. MD, 60 E 42nd St., New York 17, 281 p. $2.

* * *

"Handbook of Cupola Operation." Book covers cupola construction, successful operation, charges, blowers, etc. It is clearly written and well illustrated. A combination practical and technical book devoted to methods, materials and results as reported by practicing foundrymen. American Foundrymen's Assn., 222 W. Adams St., Chicago 6, 470 p. $4.50 to AFA members, $5.50 to non-members.

* * *

"ASTM Methods of Chemical Analysis of Metals." Revised volume gives all of the methods issued by ASTM covering the chemical analysis of metals, including several new photometric procedures. There are 35 standards and all major ferrous and nonferrous metals and alloys are covered. American Society for Testing Materials, 1916 Race Street, Philadelphia 3, 412 p. $4.50.



How to Select the Correct Grinding Wheel

How to keep down the cost of snagging and billet grinding is a question asked in many plants today. This two-part article presents helpful suggestions for cost savings in grinding operations. In this, the first part, the author outlines simple, practical methods of selecting the correct wheel for a given job and points out some of the more common fallacies which often lead to cheap wheel costs, but excessively high cost per pound of metal removed.

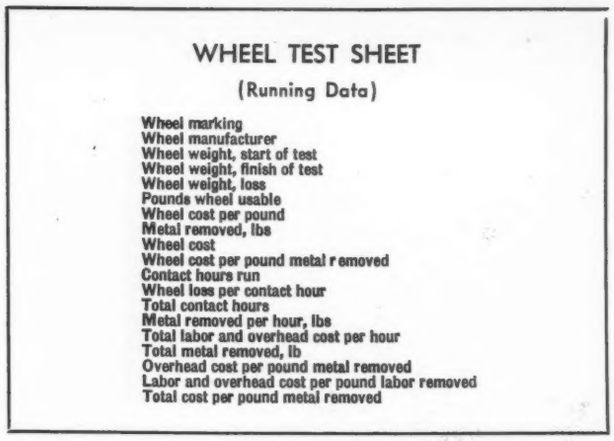
o o o

By R. B. FAIR
Abrasive Engineer, Simonds Abrasive Co. Philadelphia

SNAGGING castings and grinding billets are such similar operations that what makes for low cost in one applies almost equally to the other. Both are rough grinding operations in which rapid material removal is important, while close accuracy and fine surface quality are usually unimportant.

Much inefficient snagging and billet grinding is due to imperfect knowledge of the relative importance of the two principal elements which make up the total cost. Probably the most common mistake is to overstress the importance of wheel cost, and thus use long-wearing wheels which remove material too slowly, with the result that the combined labor and overhead cost goes up so high that the total overall cost is excessive. Other shops which stress high production with resulting low labor and overhead cost, sometimes obtain these at the expense of excessive wheel wear, the end result being, again, high total cost.

A reasonable total cost depends upon obtaining the most efficient balance between wheel cost and rate of production, that is, between the total amount of metal a wheel will remove before it is worn out and the speed with which it removes metal. This depends upon the specifications of the wheel and the skill with which it is used. It is wheel selection with which this article is concerned. Correct use of the wheel will be discussed in the second article to be published next week.



WHEEL TEST SHEET

(Running Data)

Wheel marking
Wheel manufacturer
Wheel weight, start of test
Wheel weight, finish of test
Wheel weight, loss
Pounds wheel usable
Wheel cost per pound
Metal removed, lbs
Wheel cost
Wheel cost per pound metal r emoved
Contact hours run
Wheel loss per contact hour
Total contact hours
Metal removed per hour, lbs
Total labor and overhead cost per hour
Total metal removed, lb
Overhead cost per pound metal removed
Labor and overhead cost per pound labor removed
Total cost per pound metal removed

FIG. 1—Suggested form for recording data collected while running a test.

It is necessary, for comparison purposes, to have a unit in which costs can be expressed. There are two—cost per ton of castings or billets and cost per pound of metal removed. Selection of the unit is an important factor in wheel selection, to which enough thought is seldom given. If the wrong unit is selected for a shop, it may result in improper wheels being used.

It is evident that if all the castings snagged in a foundry are the same shape and size, and if the sprues, gates, and risers have been uniformly trimmed before snagging, it will make no difference whether the unit costs are figured on pounds of metal removed or the tonnage of snagged castings. Such conditions seldom exist.

While there are foundries which use tonnage of castings as the unit of measurement, those that have given careful consideration to the question seem to be fairly well agreed that in a foundry which produces both large and small castings of different degrees of complication as to shape, the best practice is to use pounds of material removed as the cost unit. Obviously, the cost per ton of castings will be much higher for small, complicated castings than for large simple ones, a fact which makes comparison on the tonnage basis useless. On the other hand, the cost per pound of metal removed should be about the same for all castings of the same material when ground on the same type of machine with the same type of wheel. It is recommended that the calculations be on the basis of cost per pound of metal removed, especially when testing wheels to select the most efficient one.

In billet grinding, the aim is to remove as little material as possible, while producing a billet free from defects, so that as much metal as possible can be sold, and the selling price is on a tonnage unit. It is apparent, then, that the tonnage basis is entirely satisfactory when testing wheels for billet grinding when the test is long enough to approximate ordinary production. That is, if a large number of wheels are to be tested, say 300 or more, calculate costs on the basis of tonnage of good billets produced. But if only a few wheels are to be tested, on a few billets, it is better to use the pounds of metal removed as the unit.

Another reason for the difference in method of figuring costs is that on castings there is a definite amount of metal to be removed from a given casting, whenever one like it comes to the grinder. The amount of defects to be removed from a billet probably averages around 3 to 4 pct for mills which have good melting and rolling methods. The defects in some billets are so shallow that they can be removed by merely grinding off the skin. Others are so deep that large amounts of material must be removed. When poor melting or rolling practice requires the removal of as much as 10 to 15 pct of the weight of the billet, the cost of grinding is so high that it is usually cheaper to scrap and remelt the billet.

The best managed foundries go to great pains to standardize on wheels to be used for various types, or at least classes, of castings. The best way to do this is by testing. It is admittedly desirable to keep the number of wheels to be tested at a minimum. To make a tentative selection of test wheels a knowledge of the fundamentals of wheel action is desirable.

Snagging and billet grinding wheel specifications are determined by the characteristics of the material to be ground, speed and pressure, exactly as are wheels used for other kinds of grinding. The same general rules governing wheel selection apply in determining the kind and size of abrasive, the type and grade of bond, and the structure or spacing of the grains. These fundamentals are:

(1) *Type of abrasive.*—Silicon carbide abrasive is used for very hard materials and for those of low tensile strength such as gray iron, chilled iron, unannealed malleable iron, brass, soft bronze, aluminum and aluminum alloys. Aluminum oxide abrasive is best for tough materials of high tensile strength. It is used for all billet grinding and for snagging carbon steel, stainless steel, tough bronze and annealed malleable iron.

(2) *Grain Size.*—Coarser grains take larger chips and, under ordinary conditions, remove material faster than small grains. But that is true only when the grains are able to penetrate the material to an adequate depth. Thus it is desirable to use the larger grains on the softer materials, and vice versa. On materials that can be penetrated easily, grains as large as No. 12 are advisable. That size can often be used on annealed malleable castings in a grain combination. On the other hand, grain sizes 16 to 24 are sometimes used when a better finish is desired, as in spot grinding stainless steel sheets. If only light pressure can be applied, as with light floor stands and portable machines, 16 to 24 grit must often be used. If a smooth surface is essential, even finer grits may be used.

(3) *Structure.*—Structure, which is the Standard Wheel Marking System is indicated by the numeral in fourth position, indicates how closely the grains are spaced. Its effect on wheel action is closely tied with the grade of the wheel. Most snagging of the risers and fins on castings is done with wheels of medium grade and medium, Nos. 7 to 6, structure. Billets are usually ground with a wheel that is hard in grade and structure. Structure 4 to 3 is usual. This is particularly true when high pressures are used. In general, it is well to use opener structures with the softer materials so that the grains will be able to penetrate to the utmost, as well as provide clearance for the chips.

(4) *Bond type*—Snagging and billet-grinding wheels may be made of vitrified, resinoid or rubber bond. Vitrified is used chiefly for grinding materials which are extremely heat sensitive, and which, therefore, should be ground at low speed. For other materials the low speed is a disadvantage since it makes for slow material removal. The top limit for vitrified wheels is 6500 sfpm, while resinoid and rubber whe

may be safely operated as fast as 9500 sfpm. The higher speed considerably increases the rate of material removal, which in turn reduces the overhead and labor more than enough to offset the higher price of the wheel.

(5) *Grade.*—The grade, that is the softness or hardness of the wheel, is the element in wheel selection which chiefly determines the life of the wheel, although structure also has an effect. A soft grade of bond permits the abrasive grains to be pulled out quickly, which makes for faster material removal, but shorter life. Harder wheels hold the grains tenaciously, sometimes to the point where it becomes too dull for effective material removal.

In general, the characteristics of the material to be ground affect the grade to be selected. Since a soft material dulls the abrasive grain only slowly, it may remain longer in the wheel before losing its material removing ability. Therefore, a harder grade may be used than with a hard material which dulls the grains quickly. The general rule is: Harder grades for soft materials; softer grades for harder materials, with other things being equal.

While these fundamentals are not sufficient basis for making final selections of wheels for snagging or billet grinding, understanding them will make it unlikely that an utterly unsuitable wheel will be selected for test—as sometimes happens. The number of wheels to be tested can be further reduced by referring to the accompanying tabulation of Wheel Recommendations, Table I for billet grinding, and Table II for snagging. These recommendations, however, should be used only as a guide. Nothing but actual tests of wheels under shop conditions will definitely determine the best wheel for a job.

Even the standards arrived at by tests should not be considered as final and unchallengeable. Slight changes in the work piece, or in the machine, may make it desirable to run new tests. It should not be overlooked that grinding wheel manufacturers are constantly improving their wheels as a result of research and changed manufacturing processes. The best wheel for a specific job today, may be greatly surpassed in performance by a development of a month from now.

To cite an example: One foundry had made exhaustive tests of wheels for a certain job. The test wheels were of different specifications and of various makes. The wheel selected and standardized for that job was, by the new standard markings, an A141-N7-B1. For many months it had given service which satisfied the foundry, both as to material removal rate and life.

Later, it was suggested that the standard wheel be tested against three other wheels. The results of the test are shown below:

Wheel Specifications	Wheel Cost per lb. of Metal Removed	Labor and Overhead Cost per lb. of Metal Removed	Total Cost per lb. of Metal Removed
A141-N7-B1 (Standard wheel)	35.6¢	5.6¢	41.2¢
A126-N7-B3	26.7¢	6.1¢	32.8¢
A126-M7-B1	37.7¢	5.6¢	43.3¢
A141-P5-B1 (Best by test)	17.7¢	7.1¢	24.8¢

The significant points to note in this table are:) The test brought to light a wheel which would move metal for 60 pct of the cost which was formerly considered satisfactory; (2) the only difference between the old standard wheel and the best-by-test wheel is that the latter is two grades harder, and has closer grain spacing; (3) the wheel cost was naturally lower for the harder, denser wheel, due to its longer life. But the degree to which wheel cost was reduced, more than 50 pct, by the slight change was really surprising to the shop management; and (4) also expected was a rise in the labor and overhead per pound of metal removed. But the amount of the rise, from 5.6c to only 7.1c, was offset more than 18 to 1 by the saving in wheel cost. The annual saving to that foundry on that operation alone was approximately $10,000.

TEST SHEET

Snagging and Billet Grinding
Recapitulation of observed data

Wheel marking
Manufacturer's name
Number of wheels tested
*Weight of billet
Metal removed, lb
*Loss in weight of metal, pct
Labor and overhead expense per pound metal removed
Wheel cost per pound of metal removed
Total cost per pound metal removed
*Labor cost per ton of billets ground
*Wheel cost per ton of billets ground
*Total cost per ton of billets ground
Average life of wheel
Average pounds removed per wheel
*Average pounds ground upon per wheel

*These items would not be used for snagging.

FIG. 2—Form for recapitulating data from form shown in fig. 1 for final comparison.

In testing wheels for snagging and billet grinding it is important to keep clearly in mind the purpose of the test, namely, to select a wheel which will give the lowest overall cost. The ability of a wheel to grind accurately, produce a fine surface finish, or hold a formed shape, are of no importance. The test should therefore give the wheel cost per pound of metal removed, which is measured by the price of the wheel and the total number of pounds of metal removed during the life of the wheel, and the labor and overhead expense per pound of metal removed, the measure of which is the total hourly rate for labor plus overhead, and the pound of metal removed per hour.

The time depends upon the amount of time the operator takes off for personal needs, and the time the wheel and work are actually in contact. In both snagging and billet-grinding the wheel is in contact with the work only part of the grinding time, due to irregularities in the work, wheel unbalance, and machine vibration which cause the wheel to bounce. Methods of increasing the contact time are given in the second article of this series.

Attempts have been made to test wheels for specific jobs under what might be called laboratory methods. While these tests have given some useful information for use in later tests and in clarifying certain points in grinding action, they were not too effective for the real purpose of a test is to determine which specifications of wheel to use for given jobs, and the laboratory tests did not duplicate the actual shop conditions of snagging.

In testing wheels for snagging or billet grinding it is essential to run the tests under conditions as nearly as possible the same as those that will be encountered in regular everyday production. The best plan is to

TABLE I

Wheel Recommendations for Billet Grinding

Material	Type of Machine	Type of abrasive	Type of Bond	Wheel Marking
High carbon and high speed steels	High speed swing frame	Aluminum oxide	Resinoid	A126-S7-B1
	Low speed swing frame	Aluminum oxide	Vitrified	A16-R5-V2
	Flexible shaft	Aluminum oxide	Vitrified	A24-R5-V2
	Flexible shaft	Aluminum oxide	Resinoid	A16-S7-B1
Stainless and alloy steels	High speed swing frame	Aluminum oxide	Resinoid	A126-U5-B1
	Low speed swing frame	Aluminum oxide	Vitrified	A16-R5-V2
	Flexible shaft	Aluminum oxide	Vitrified	A20-S5-V2
	Flexible shaft	Aluminum oxide	Resinoid	A16-S7-B1

test the wheels in actual production, keeping careful records.

In making such tests, the following conditions should exist:

(1) The same machines should be used as will be used in regular production; (2) the same operators should do the test grinding as do the production grinding; (3) tests should be on the same type of work as the wheels will commonly be used on; and (4) tests should not be confined to a few wheels of each specification.

The reason for the first condition is that the design and size of the machine and its condition as to bearings and amount of vibration, affect wheel performance. The skill of the operator is the reason for requirement No. 2.

Typical of the reasons for No. 3 is the following case: In a series of tests run by a foundry, an effort was made to keep conditions uniform by testing all wheels by grinding risers. But, on many of the castings snagged in regular production, it was not a riser but an acetylene cut area which was snagged. That

TABLE II

Wheel Recommendations for Snagging

[Wheel markings shown are the standard markings adopted by the Grinding Wheel Manufacturers Assn.]

Material or Part	Type of Machine	Type of Abrasive	Type of Bond	Wheel Marking
Aluminum	Low speed	Aluminum oxide	Resinoid	A24-07-B1P
	High speed	Aluminum oxide	Resinoid	A16-07-B1P
Brake shoes, chilled iron		Silicon carbide	Vitrified	C16-U3-V3
Brass and bronze (soft)	Low speed	Silicon carbide	Vitrified	C24-P5-V3
	High speed	Silicon carbide	Resinoid	C24-P7-B1P
Bronze (hard)		Aluminum oxide	Vitrified	A16-P5-V1
Cast iron	Low speed	Silicon carbide	Vitrified	C16-R3-V3
	Low speed portables	Silicon carbide	Vitrified	C24-R3-V3
	High speed	Silicon carbide	Resinoid	C16-P7-B3
	High speed portables	Silicon carbide	Resinoid	C16-R5-B3
Chain links (annealed malleable iron and steel)	Low speed	Aluminum oxide	Vitrified	A20-S5-V1
	High speed	Aluminum oxide	Resinoid	A16-S7-B1
Chain links (unannealed malleable)	Low speed	Silicon carbide	Vitrified	C16-U3-V3
	High speed	Silicon carbide	Resinoid	C16-S7-B1
Chilled iron	High speed	Silicon carbide	Resinoid	C16-S7-B1
	Low speed	Silicon carbide	Vitrified	C16-S3-V3
Couplers and draw bars	Low speed	Aluminum oxide	Vitrified	CA12-X3-V1
	High speed	Aluminum oxide	Resinoid	A126-T6-B1
Crankshaft, balancing (automotive)	Low speed	Aluminum oxide	Vitrified	A20-05-V1
	High speed	Aluminum oxide	Resinoid	A126-Q5-B3
Forgings	High speed	Aluminum oxide	Resinoid	A126-S6-B1
	Low speed	Aluminum oxide	Vitrified	A20-R5-V2
Frogs and switches (manganese steel)		Aluminum oxide	Resinoid	A126-S7-B1
Housings, auto axle	Low speed	Aluminum oxide	Vitrified	A16-S5-V2
	High speed	Aluminum oxide	Resinoid	A16-S7-B1
Malleable iron, annealed	Low speed floor stand	Aluminum oxide	Vitrified	A16-P4-V1
	Low speed swing frame	Aluminum oxide	Vitrified	A16-P4-V1
	Portables	Aluminum oxide	Vitrified	A24-R5-V2
	High speed floor stand	Aluminum oxide	Resinoid	A16-R5-B3
	High speed swing frame	Aluminum oxide	Resinoid	A126-S7-B1
	Portables	Aluminum oxide	Resinoid	A16-S7-B1
Malleable iron, unannealed	Low speed floor stand	Silicon carbide	Vitrified	C16-U3-V3
	Low speed swing frame	Silicon carbide	Vitrified	C16-U3-V3
	Portables	Silicon carbide	Vitrified	C20-U3-V3
	High speed floor stand	B silicon carbide	Resinoid	BC146-Q7-B1
	High speed swing frame	B silicon carbide	Resinoid	BC146-S7-B1
	Portables	Silicon carbide	Resinoid	C16-S7-B1
Monel metal		Aluminum oxide	Vitrified	A24-Q5-V1
Sad irons		Silicon carbide	Vitrified	C16-R3-V3
Safes		Aluminum oxide	Vitrified	A16-R5-V2
Steel castings, low carbon	Low speed swing frame	C aluminum oxide	Vitrified	CA16-R5-V1
	High speed swing frame	Aluminum oxide	Resinoid	A126-S7-B1
	Low speed floor stand	C aluminum oxide	Vitrified	CA16-R5-V1
	High speed floor stand	Aluminum oxide	Resinoid	A16-R5-B3
	Low speed portables	Aluminum oxide	Vitrified	A24-S5-V2
	High speed portables	Aluminum oxide	Resinoid	A16-S7-B1
	Low speed swing frame	Aluminum oxide	Vitrified	A16-P4-V1
	High speed swing frame	Aluminum oxide	Resinoid	A126-S7-B1
Steel castings, manganese	Low speed floor stand	C aluminum oxide	Vitrified	CA16-Q5-V1
	High speed floor stand	Aluminum oxide	Resinoid	A16-R5-B3
	Low speed portables	N aluminum oxide	Vitrified	NA20-05-V1
	High speed portables	Aluminum oxide	Resinoid	A16-P7-B1
Stove parts, cast iron		Silicon carbide	Vitrified	C16-S5-V3 (special)
Wrenches		Aluminum oxide	Vitrified	A24-R5-V2
Wrought iron		Aluminum oxide	Vitrified	A16-S5-V2

type of surface acts as a dresser which keeps the face of the wheel sharp. Tests on the risers indicated that a soft wheel was needed, but in actual practice the soft wheels would not stand up under the dressing action of the cut surface.

Although all wheels of a given marking made by one wheel manufacturer can be relied upon to act the same under uniform conditions, there are other factors surrounding tests which make it highly desirable to test as many wheels as possible of a kind. Take the case of a long test of wheels for billet grinding which was run by a leading steel company. Two wheel specifications were being tested to determine on which to standardize. Of specification A126 - V6 - B514, 103 wheels were tested. Of specification A126-U8-B513, 105 wheels were tested. Thirty swing frame grinders were used and tests were run as regular production.

The 103 wheels of specification A126-V6-B514 averaged 6279 lb. of metal per wheel at an average rate of 411 lb per hr. The other 105 wheels gave much better results, 6941 lb. of metal removed per wheel, at the rate of 485 lb. per hr.

Yet many individual wheels of the least suitable specifications gave much better total production and production per hour than individual wheels of the winning specification. In short, had only a dozen or so wheels of each specification been tested, it is entirely possible that the least suitable wheel of the two would have been selected as standard, with a resulting large dollars-and-cents loss to the mill.

Such wide variations from normal performance as showed up in the tests were readily accounted for by differences in the skill of the thirty operators, and in the varying condition of the machines.

Fig. 1 shows a typical test sheet for recording the observed data while running the tests. This information may then be tabulated on a form as shown in fig. 2. Obviously, such information not only helps select standard wheels, but shows up inefficiencies in their use. What these inefficiencies are, and how to correct them, will be discussed next week.

Processing 4 Pct High-Purity Aluminum Alloy

THE cold working of high purity aluminum alloy containing 4 pct Cu and its relation to age hardening was discussed in a paper by M. L. V. Gayler at the annual autumn meeting of the Institute of Metals, London, and reported in *Metallurgia* (London), September 1946. The paper was described as throwing new light on the effect of cold work on the age hardening properties and on the relationship between the two processes, and as a result of experimental work data were obtained from which the following conclusions were drawn:

(1) Cold work accelerates the rate of aging by an amount determined by the degree of cold work given.

(2) Microstructural changes have shown that the effect of cold work on a quenched specimen is to bring it into the fully aged state normally produced by aging at room temperature. The effect of further aging at room or higher temperatures was related to conditions determined by the normal time-hardness curves.

(3) Lattice strain caused by cold work was shown to be relieved by the formation of submicroscopic (or microscopic, depending on the previous condition of the alloy and its aging temperature) crystallites and, simultaneously, submicroscopic precipitates of copper-rich particles.

(4) The course of aging curves of cold worked and aged material was considered in relation to the amount of lattice strain the material is capable of withstanding. The inference has been drawn that measurement of lattice strain, resulting from the cold-rolling of a soft-annealed specimen, may be associated with Brinell hardness.

(5) The mechanism of the relief of a strain caused by cold work is similar to that which occurs in relief of strains set up during age-hardening, i.e., by the formation of crystallites.

A second paper, entitled "Aging of High Purity Aluminum Alloy Containing 4 Pct Cu." by the same author, was also presented. This paper embodied further experimental results on the aging of this alloy.

The effect of rate of quenching on subsequent aging at room temperature and at 265°F was studied. Changes in microstructure which take place on aging were also studied at room temperature and at 265°F was on specimens cooled at different rates from the solution heat-treatment temperature and correlated with the accompanying changes in Brinell hardness. It was shown that decreasing the rate of quenching has a pronounced effect on the subsequent aging at room temperature; but at 265°F the aging curves differ from each other only in the early stages, i.e., up to about 8 hr at 265°F.

The evidence obtained proves that the age-hardening of these alloys is due to the precipitation of copper or copper-rich particles and to the simultaneous formation of crystallites of the aluminum solid solution stable at the temperature of aging, and not to the precipitation of either α- or β-$CuAl_2$. The principal points in the evidence are: (*a*) The first increase in hardness is due to the segregation of copper atoms to form plates on (100) planes. (*b*) The "flat" on time-hardness curves is associated with the formation of copper-rich aggregates of a critical size (depending on the aging temperature), the precipitation of which relieves the strain-hardening set up in the surrounding matrix. Submicroscopic particles of copper or of copper-rich aggregates are thus precipitated and submicroscopic crystallites of the new aluminium solid solution are formed. (*c*) The second increase in hardness is due to two processes occurring simultaneously: (1) the growth of the submicroscopic particles to visible size, and (2) the formation of fresh aggregates in strain-free areas by the further diffusion of copper atoms. (*d*) After maximum hardness has been reached and when softening has definitely set in, particles of α-$CuAl_2$ are to be observed in strain-free areas. The precipitated copper-rich particles are at random orientation with respect to the matrix, while particles of the α-$CuAl_2$ phase are oriented with respect to the matrix. (*e*) The polymorphic transformation α-$CuAl_2 \longrightarrow \beta$-$CuAl_2$ takes place in the softened alloy with no increase in hardness.

The precipitation of the copper-rich aggregates is a discontinuous process, while the precipitation of α-$CuAl_2$ in alloys aged at temperatures higher than room temperature is a continuous process.

A Practical Method Of Specifying Cast Irons

By K. R. GEIST

Technical Engineer in Charge, Precision Casting Section, Engine and Condenser Dept., Allis-Chalmers Mfg. Co., Milwaukee

and

W. A. HAMBLEY*

Works Metallurgist, Allis-Chalmers Mfg. Co., Milwaukee.

A simple, practical method for specifying grades of cast iron for specific applications, originally developed for use by the Allis-Chalmers engineering department, is described herein. This method, employing a simple code, enables a design engineer to quickly and accurately select the grade of iron with the desired characteristics, taking into consideration strength and hardness in the controlling section size.

IN an effort to simplify and standardize the specification of various grades of cast iron required for engineering purposes, the metallurgical department of Allis-Chalmers has established a method of indicating the grade of iron required for the specific application. This method has proven eminently satisfactory over the past 2½ yr in enabling design engineers to specify properly the grade of iron required.

As an introduction to this method of specifying, the conditions listed below form the basis of the plan. It should be borne in mind that this method was developed for the use of engineers of Allis-Chalmers and will require minor alterations to adopt it for other plants. The basic conditions are:

(1) Cast irons shall be specified by number as taken from figs. 1 to 6. The numbers, 20, 25, etc., correspond to ASTM 48-36 classes which designate the required tensile strength in a test bar. These classes have been correlated with section size so that an engineer, in designing, may anticipate the strength and hardness he may expect to obtain in the casting. Normally, for test purposes, a 1.20-in. bar will be used unless a 2-in. bar is desired for the heavy sections.

(2) The figures set up in this plan are the average for unalloyed cast iron.

(3) The engineer shall specify and put on the drawing the grade of iron desired.

(4) Before specifying any alloys or heat treatment the engineer should consult the research department. Due to the mass of conflicting information it is impossible at the present time to make available accurate charts showing the effects of the various alloys. There are only four alloys at present which appear to have much economic importance or advantage for use in the foundry; namely, copper, nickel, chromium, and molybdenum. There are several alloys, such as vanadium and boron, employed to obtain certain specific properties but which are not economical for general use. Nickel and copper, producing the same effect on the physical properties, should be interchangeable, depending upon availability. Unless it is essential for certain desired properties no alloys should be specified.

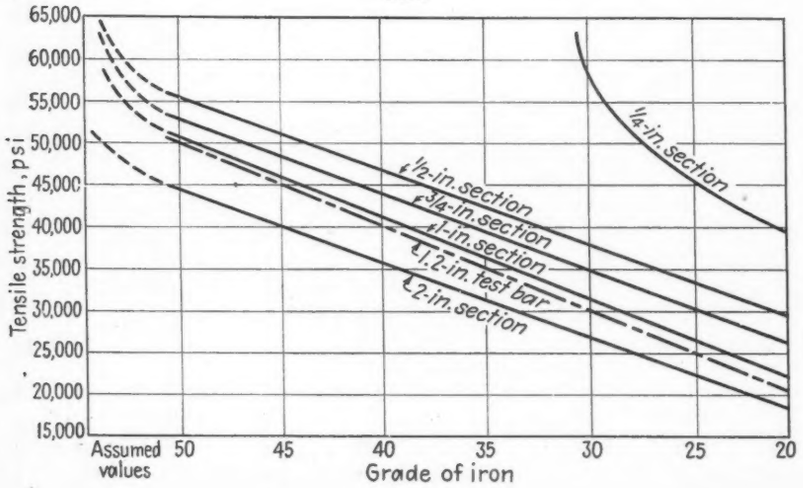
The steps which must be taken to correctly specify a grade of iron are as follows:

(a) The iron grade will be the base

The method of specifying cast irons described in this article is the direct result of extensive research previously conducted in Allis-Chalmers' foundries and discussed in the article "Selecting the Correct Type of Cast Iron," THE IRON AGE, Oct. 17 and 24. —Ed.

* Mr. Hambley is now general manager, Slinger Foundry Co., Slinger, Wis., and general manager, foundry division, Falls Mfg. Co., Menomonee, Wis.

FIG. 1—Relationship between tensile strength and grade of iron for various section sizes.



number (table I).

(b) Any nickel or copper addition shall be taken from table I, and the code number shall be placed as the first number in front of the grade or base number.

(c) Any chromium addition shall be taken from table I, and the code number shall be placed as the second number in front of the base number.

(d) Any molybdenum addition shall be taken from table I, and the code number shall be placed as the third number in front of the base number.

(e) Any subsequent heat treatment should also be specified and recorded on the drawing. These symbols and numbers should follow the iron grade number and be separated from the grade by a dash. First the type of heat treatment and then the temperatures. The code numbers are found in table I.

As an example of the use of this method, an unalloyed iron with no heat treatment should be specified by only the grade number, that is, grade No. 40. If the same iron is to be stress-relieved, the specification should be grade 40B. If the casting requires 1 pct Cu and 40,000-lb iron, the specification should read grade 340.

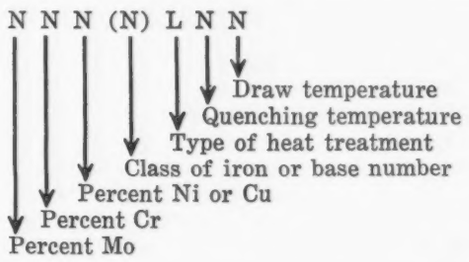
If the casting requires 0.5 pct Cr, no nickel or copper, and 40,000-lb iron, the specification should read grade 2040. Thus,

2 means ..... 0.5 pct Cr
0 means ..... 0.0 pct Ni or Cu
40 means ..... class 40 iron

If the casting requires 0.30 pct Mo, 1.5 pct Ni and 50,000 lb iron, the specification should read grade 20550. If it is desired to quench and draw this iron to a certain hardness or strength, the specification should read grade 20550-C34. Thus,

2 means..... 0.30 pct Mo
0 means..... 0.0 pct Cr
5 means..... 1.5 pct Ni or Cu
50 means..... class 50 iron
C means..... quench in oil and draw
3 means..... quench from 1600° to 1650°F
4 means..... draw at 700°F

Briefly, where N represents a number and L represents a letter, the numbering system follows this plan:



The six charts, figs. 1 to 6, have been drawn to take care of sections from ¼ in. to 6 in. Since most of the castings produced here are less than 2 in. thick, the tensile strength of the ¼ to 2-in. sections has been plotted on fig. 1. The Brinell hardnesses of the same sections have been plotted on fig. 2. For the 2, 3, 4 and 6-in. sections, separate charts (figs. 3, 4, 5 and 6) have

TABLE I

Code for Specifying Alloys and Subsequent Treatments

Code No.	Nickel or Copper		Chromium		Molybdenum	
	Range Pct	Average Pct	Range Pct	Average Pct	Range Pct	Average Pct
0	0	0	0	0	0	0
1	0.40–0.60	0.50	0.20–0.35	0.25	0.10–0.20	0.15
2	0.70–0.85	0.75	0.35–0.65	0.50	0.25–0.35	0.30
3	0.95–1.10	1.00	0.65–0.85	0.75	0.40–0.60	0.50
4	1.20–1.40	1.25	0.90–1.10	1.00	0.60–0.75	0.65
5	1.45–1.60	1.50	1.15–1.35	1.25	0.75–0.95	0.80
6	1.70–1.85	1.75	1.40–1.60	1.50	0.95–1.10	1.00
7	1.95–2.15	2.00	.....	....	1.15–1.40	1.25

Heat Treatment

A = Full Anneal—Used to reduce hardness and strength. Heat to 1400°F, ±50°. Hold 1 hr per in. and furnace cool.
B = Stress Relieve—Used to relieve stresses set up in casting or welding. Heat to 950°F±50°. Hold 1 hr per in. and furnace cool.
C = Quench in oil and draw.
D = Quench in water and draw.

Code No.	Quenching Temperature, °F	Draw Temperature, °F
0	0	0
1	1500–1550	400
2	1550–1600	500
3	1600–1650	600
4	1650–1700	700
5	.....	800
6	.....	900
7	.....	1000
8	.....	1100
9	.....	1200

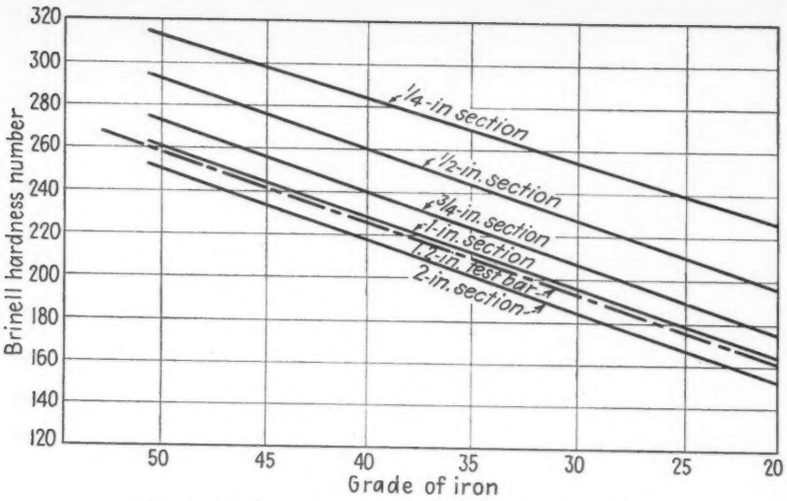


FIG. 2—Hardness ranges found in various grades of iron.

been prepared for each, the tensile strength and hardness being on the same chart. It may be well to point out that these are average figures and that there will be some slight variations depending on the foundry practice and control.

The following are a few specific examples of the use of this data. An engineer has designed a casting where the controlling section is ½ in. and the design requires 40,000 psi in that section. What class iron should be specified? This information can be taken from fig. 1. A line is projected along the 40,000-lb level until it intersects the ½-in. section curve. From the intersection the line is dropped down to the base line where it intersects between the class 30 and 35. Grade 35 should be specified because class 30 may not always give 40,000 psi in the ½-in. section. From fig. 2 it can be seen that a Brinell hardness of 244 to 260 can be expected in that section with grade 35. The high reading would be obtained from a hot shake-out, the low from cooling in the sand. Since the line dropped from the intersection to the base line crossed the 1.2-in. test bar line at 32,000 psi, a tensile strength of 32,000 psi on the test bar would indicate to the engineer that his specification was being met.

If 40,000 psi is desired in a 2-in. section and no alloys are specified or desired, a line is projected along the 40,000-lb level until it intersects the 2-in. section curve and is then dropped to the base line. The chart indicates grade 45. From fig. 2 it can be seen that a Brinell hardness of 229 to 250 can be expected.

When the casting section gets to be greater than 2 in., conditions are quite different. There is considerable variation in the physical properties from the center of the section to the edge due to the slower heat transfer. If the engineer bases his design on the strength at the center of the section he should know what to expect in the casting from the information he receives from the test bar.

From fig. 5:

If the engineer desires 30,000 psi in the center of a 4-in. section, a line is projected on fig. 5 along the 30,000-lb level until it intersects the curve representing the center of the 4-in. section. Dropping the line down to the base line it can be seen that grade 40 will give the required strength in the center of a 4-in. section. From the same chart it can be seen that the same iron will pull about 35,000 psi near the edge of the section. The hardness at the center will be about 180 to 190 Brinell while at the edge it will be about 190 to 210. Correlating the strength in the 4-in. section with the 1.2 and 2-in. test bars it will be noted that a tensile strength of about 41,000 psi on the 1.2-in. and 35,000 psi on the 2-in. bar can be expected.

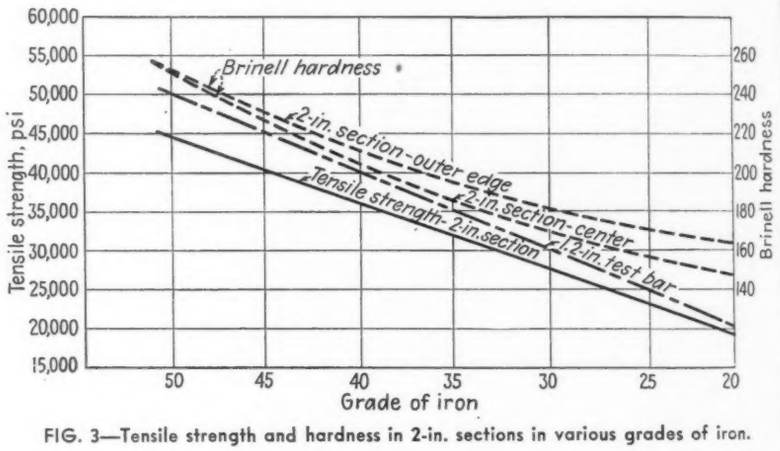


FIG. 3—Tensile strength and hardness in 2-in. sections in various grades of iron.

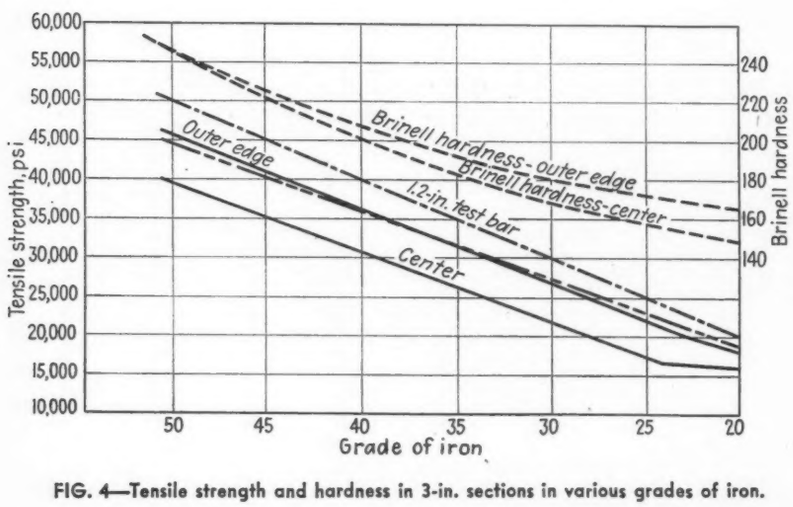


FIG. 4—Tensile strength and hardness in 3-in. sections in various grades of iron.

There are a few types of iron which cannot be classified according to strength. Two such types are the chilled iron designated as F, G and H iron on obsolete specification sheets, and heat-resistant iron for grate bars, kiln side plates and permanent molds. Hence, arbitrary code numbers have been set up for them. All Allis-Chalmers irons

having special properties are given a number below grade 20.

Chilled iron is to be specified as iron 01, 02 or 03. Alloys or heat treatment are to be coded the same as in the other grades. The depth of chill should be specified on the drawing.

Heat-resistant irons are to be specified as iron 10, 11 or 12.

Iron 10—1-in. section or less
Iron 11—1 to 2-in. section
Iron 12—Larger than a 2-in. section

The same alloy and heat treating code is to be used with these heat-resistant grades.

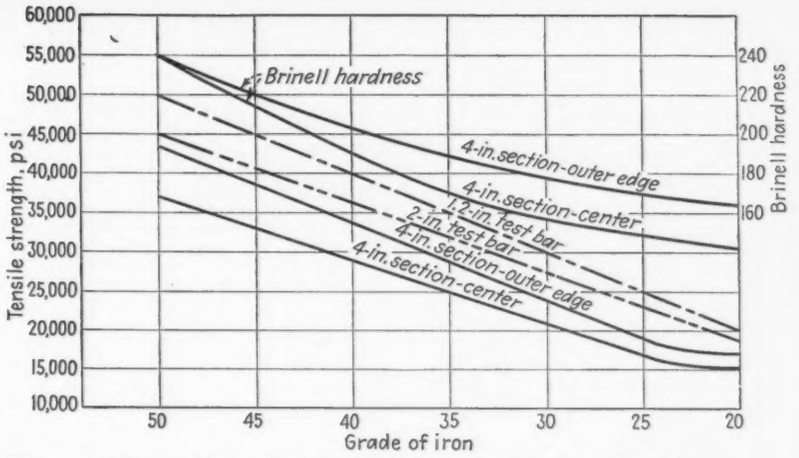


FIG. 5—Tensile strength and hardness in 4-in. sections in various grades of iron.

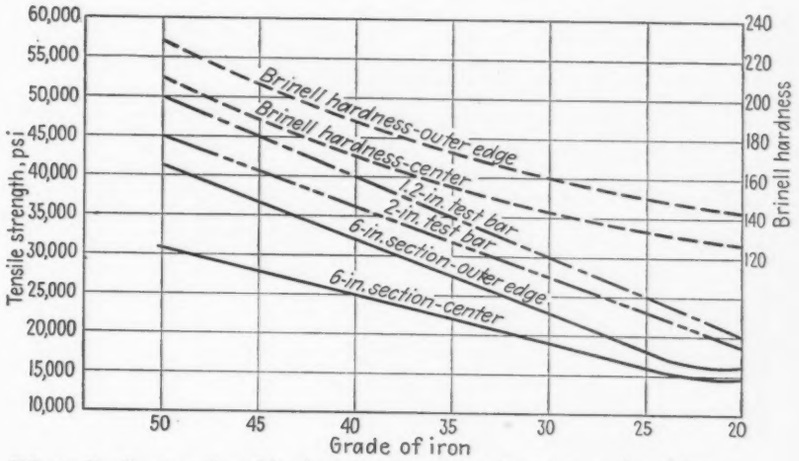


FIG. 6—Tensile strength and hardness in 6-in. sections in various grades of iron.

Separating Small Parts

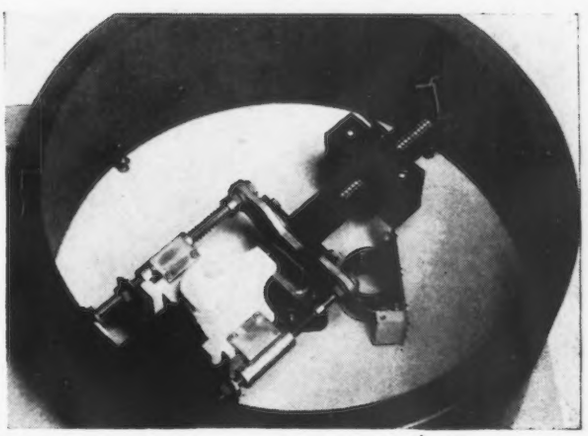
DEBURRING small steel stampings by tumbling with granite chips frequently introduces a problem of separating the parts from the chips, particularly when the former are of very small size. Faced with this difficulty, an eastern manufacturer decided on the use of a conventional Dings magnetic separator, using a short belt passing over a magnetic pulley. This worked reasonably well, but was not entirely satisfactory.

A solution was found by reversing the separator, and erecting a hopper and wooden chute near the magnetic end. The open end of the chute cleared the face of the pulley by about 3 in. so that the aggregate could fall clear into a box placed immediately below. As the mixture of tumbled parts and aggregate slides down the chute, the magnetic attraction pulls the parts out of the mass, causing them to jump the gap and adhere to the surface of the moving belt from which they are discharged at the opposite end. Separation by this means has been 100 pct.

Since residual magnetism is objectionable, it is also planned to erect a demagnetizer over the belt, near the point of discharge, and thus have the finished parts ready for immediate use without any additional handling.

Melting and Casting Combined in One Unit

NEW equipment for precision investment casting which combines induction melting with centrifugal casting in a single unit, as shown in the accompanying illustration, has been developed by Alexander Saunders & Co., New York. This unit consists of an Ecco casting machine and a 10 kva high frequency converter. With this equipment both melting and casting is accomplished rapidly as the metal is melted by induction high frequency current in a casting crucible on the arm of the motor driven machine. When the metal has been brought to a casting temperature it is cast centrifugally without further handling. This method eliminates the transfer of the molten metal from a melting unit to the casting machine. This new machine will handle up to approximately ¼ lb of steel. Larger models are available to handle up to 2 lb of metal. A working exhibit of this new equipment has been set up at the company's New York office.



Effect of Tempering on Mechanical Pr

By G. K. MANNING and G. P. KRUMLAUF

Assistant Supervisor and Research Engineer, respectively, Batelle Memorial Institute, Columbus, Ohio.

RESULTS of duplicate V-notch Charpy tests on each test heat at room temperature, —40°F and —80°F, were plotted against hardness in a similar manner as that described in the first part of this article. Again, only the plots for heats 10037 and 10042 have been included. These are shown in figs. 14 through 19. An extremely good correlation of notch-bar strength with brinell hardness of the two steels containing 0.40 pct Mo at all three testing temperatures was found to exist. Table IV indicates that the impact correlation coefficient of the two 0.40 pct Mo heats is almost as good as the tensile strength correlation coefficients given in table III. The standard errors of estimate also may be seen to be quite low for the two 0.40 pct Mo heats (table IV). Furthermore, the same table indicates that the degree of correlation is only slightly influenced by the testing temperature. Thus, one would expect to be able to predict the V-notch Charpy value of heat 10037, 95 times out of 100, to within plus or minus 4.5 ft-lb at either room temperature, —40°F, or —80°F, knowing only the brinell hardness and the fact that the specimen had been fully hardened and then tempered to within the hardness range of 230 to 410 Bhn. One would have to expand the expected spread slightly for heat 10040 if tested at either —40°F or —80°F and estimated that the V-notch Charpy value could be predicted to within about 6.5 ft-lb, 95 times out of 100. The scatter that is present in the plots for either of the 0.40 pct Mo steels may be caused principally by the degree of accuracy possible in obtaining the test data, and it may be that the real correlation between Charpy values and brinell hardness is even better than indicated by the plots.

In the first part of this two-part article, THE IRON AGE, *Oct. 24, 1946, p. 44, the authors discussed the effect of tempering practice on hardness and other physical properties.*

The appearance of the fractured surface of the Charpy specimens seemed to have little significance except to suggest the approximate energy required to break the specimen. Thus, if the fracture showed no signs of ductility but appeared completely brittle, the value recorded for it seldom exceeded 10 ft-lb. If the

FIG. 14—V-notch Charpy values, heat 10037. Specimens tested at room temperature.

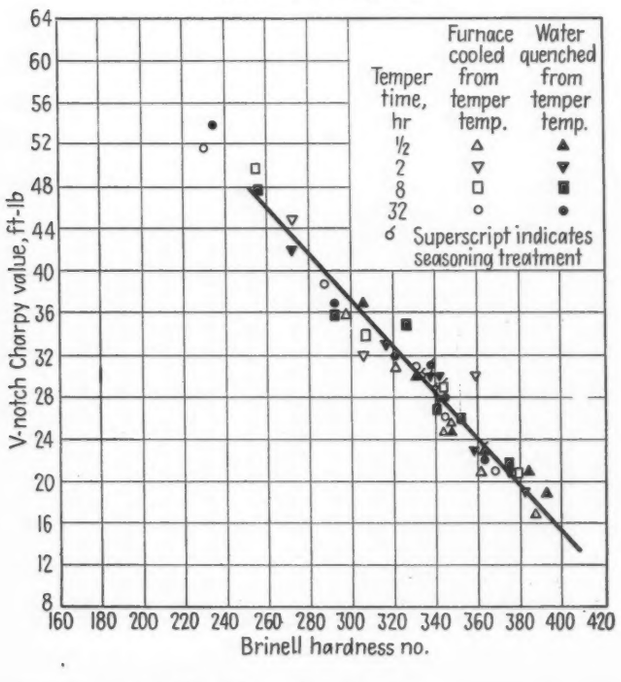
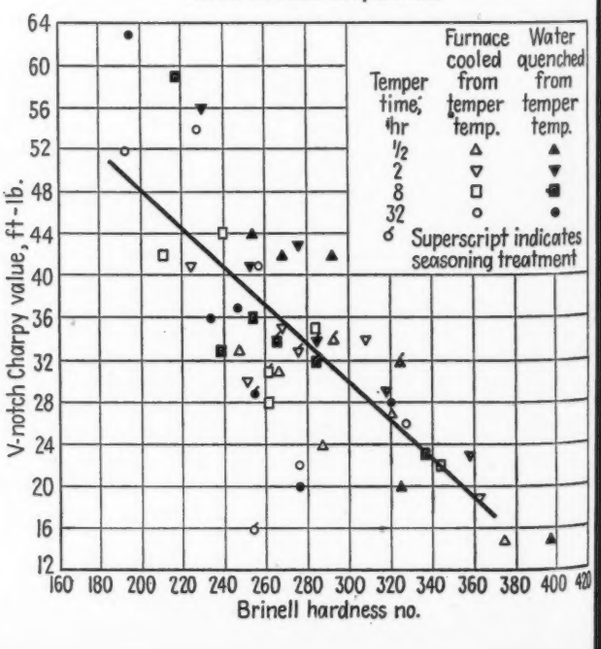


FIG. 15—V-notch Charpy values, heat 10042. Specimens tested at room temperature.



Properties . . .

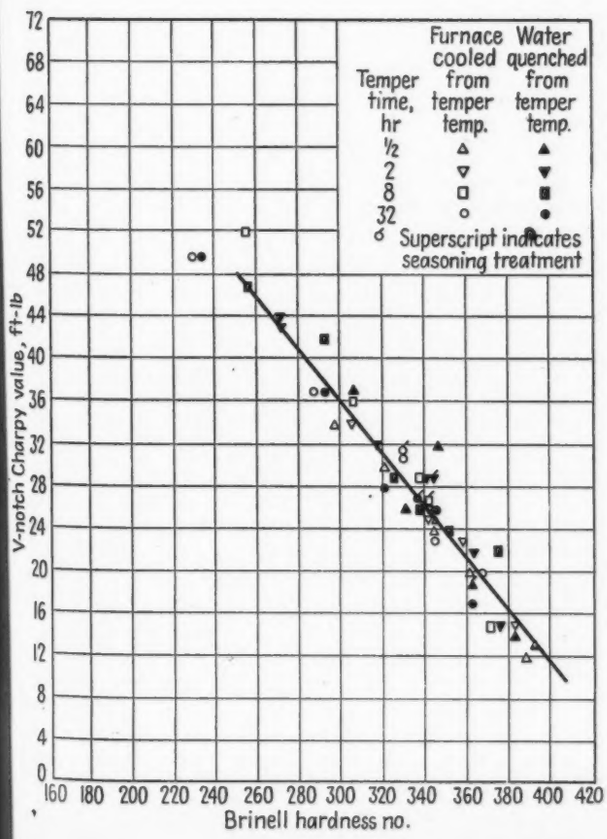
Under OSRD auspices, a series of tests was conducted to determine the correlation between hardness and other physical properties of six quenched and tempered steels under varying tempering conditions. In this, the latter half of a two-part article, the correlation found to exist between Charpy impact values and brinell hardness, at room temperature, —40 F and —80 F, is presented. The authors reveal the results of extensive tests conducted to determine the effect of tempering practice on the relationship between these properties, and also of the influence of steels susceptible to temper brittleness on such correlation.

fracture was partly fibrous and partly brittle, the recorded value usually fell between 10 and 30 ft-lb. Specimens whose recorded values exceeded 40 ft-lb invariably had completely fibrous fractures. Such a classification of fractures, with respect to Charpy values, appeared to be independent of the hardness of the test specimen.

As the molybdenum content is lowered in either series, the correlation coefficient tends to decrease and the standard error of estimate tends to increase. This trend is evident from the data representing either room temperature, —40°F and —80°F for the manganese-chromium-molybdenum series, but does not become apparent until the testing temperature is lowered to —40°F or —80°F for the nickel-chromium-molybdenum series. The scatter obtained on the plots for —40°F and —80°F of heat 10042 (0 pct Mo) is so great that statistically the data are not indicative of any relationship between hardness and Charpy values. As might be expected, a decrease in correlation is accompanied by a lowering of the line of regression (see figs. 20, 21 and 22). Again it should be pointed out that the trend appears to be much more closely associated with the molybdenum content than it does with the boron content. This decrease in degree of correlation with decrease in molybdenum is by itself no particular indictment of the low molybdenum steels because all the points on each graph were used in obtaining the correlation coefficients and the standard errors of estimate in table IV. The scatter might be caused by consistent differences in the values obtained for different temper treatments. Examination of the original data showed

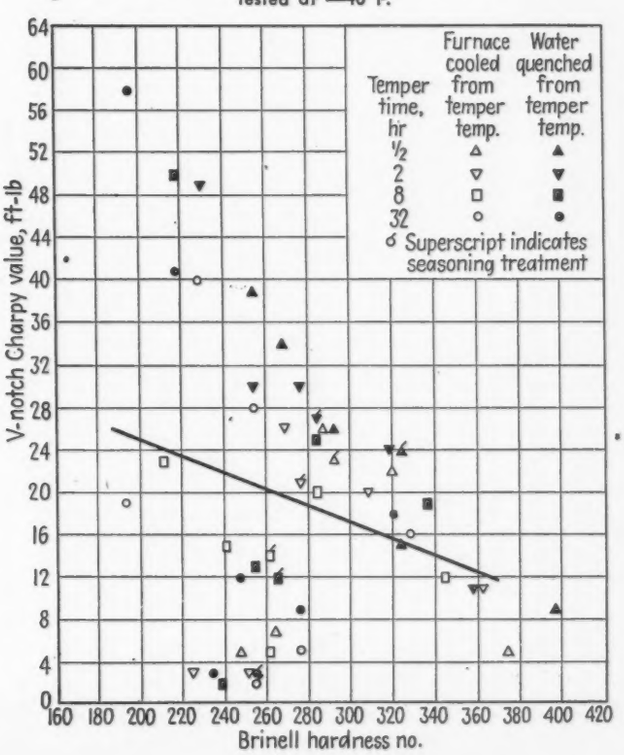
LEFT

FIG. 16—V-notch Charpy values, heat 10037. Specimens tested at —40°F.



BELOW

FIG. 17—V-notch Charpy values, heat 10042. Specimens tested at —40°F.



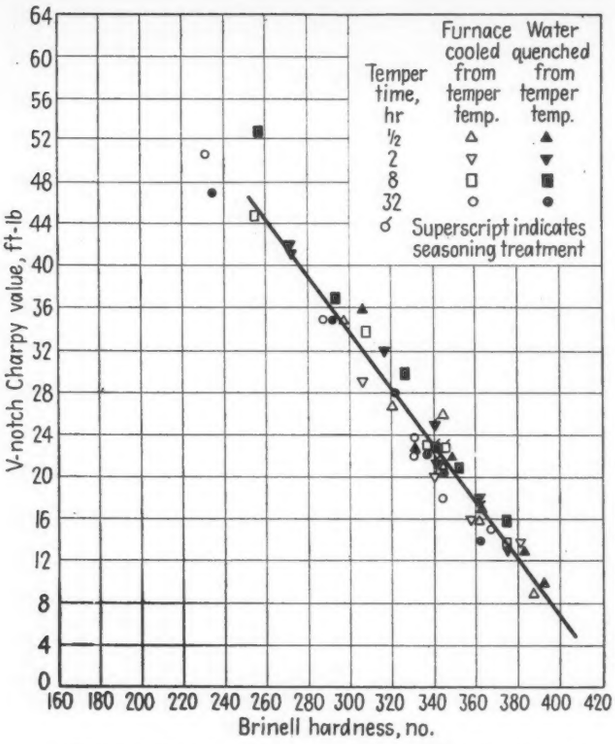


FIG. 18—V-notch Charpy values, heat 10037. Specimens tested at —80°F.

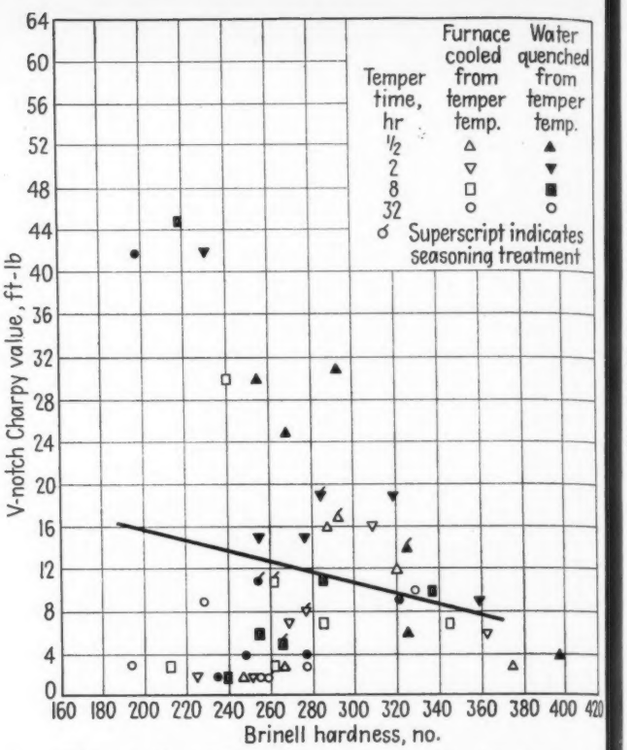


FIG. 19—V-notch Charpy values, heat 10042. Specimens tested at —80°F.

that there was a tendency for the water-quenched specimens to have higher notch bar strength than the slow-cooled specimens on those plots for the low molybdenum steels. The higher values obtained for the water-quenched specimens of the heats with lower molybdenum content merely indicates that these steels are susceptible to temper brittleness, a phenomenon previously investigated by Greaves and his coworkers.[4, 5, 6, 7, 8] Most of the investigators agree that molybdenum additions of about 0.5 pct will eliminate or, at least, greatly reduce temper brittleness susceptibility.[3, 6, 9, 10, 11, 12, 13, 14]

Deviations from the lines of regression were grouped according to time and temperature for each heat and then averaged. Table V shows these averaged deviations for all six heats. Deviations that are considered significant either because of their magnitude

TABLE IV

Correlation Coefficients and Standard Errors of Estimate For V-Notch Charpy Tests at Room Temperature, —40°F, and —80°F

Heat No.	Correlation Coefficients			Standard Errors of Estimate		
	Room Temp.	—40 °F	—80 °F	Room Temp.	—40 °F	—80 °F
10037	—0.966	—0.977	—0.978	2.30	2.09	2.25
10038	—0.976	—0.980	—0.849	1.96	1.95	4.76
10039	—0.976	—0.895	—0.644	2.27	4.46	7.28
10040	—0.976	—0.962	—0.965	2.07	3.12	3.17
10041	—0.930	—0.624	—0.685	3.46	9.62	9.58
10042	—0.752	—0.271[1]	—0.206[1]	7.30	12.59	10.85

[1] Not statistically significant of correlation.
Those correlation coefficients above about 0.75 to 0.60 indicate a real correlation, although they furnish a poor means of predicting individual values.

or because they appear to be part of a definte trend have been underscored. It was apparent from examination of the plots for heats 10038, 10039, 10041 and 10042 that water quenching after a 1200°F temper usually resulted in higher Charpy values regardless of tempering time. Therefore, the data obtained after tempering at 1200°F were not included in the averages illustrating the effect of temper time, since they would serve to mask any effiects that were lodged in the rest of the data. Similarly, data for the 800°F temper treatment did not appear to have any consistent effect on the values obtained. In the case of low or intermediate molybdenum steels, table V indicates, first, that if any of them are drawn at 1200°F, it is very important that they be rapidly cooled, and second, increasing temper times at 900°, 1000° and 1100°F tend to decrease progressively their Charpy values for a given hardness, in spite of rapid cooling.

The effect of tempering temperature, time and cooling rate, upon Charpy values for steels susceptible to temper brittleness can best be illustrated by idealizing the trend that is particularly evident in the plot for heat 10042 tested at —80°F. This is done in fig. 2. Short temper times plus rapid cooling may be thought of as always producing values at least as good as could be obtained by any other treatment. It is essential that the four steels subject to temper brittleness be rapidly cooled from the tempering temperature if tempered to hardnesses less than about 220 Bhn. Tempering time is not important. At hardnesses within the range of about 220 to 300 Bhn, it is essential that the tempering time be short. Rapid cooling is a factor, but is less important than tempering time. At hardnesses above about 340 Bhn, it makes no difference what temper practice is used.

By a comparison of figs. 18 and 19, it may be noted

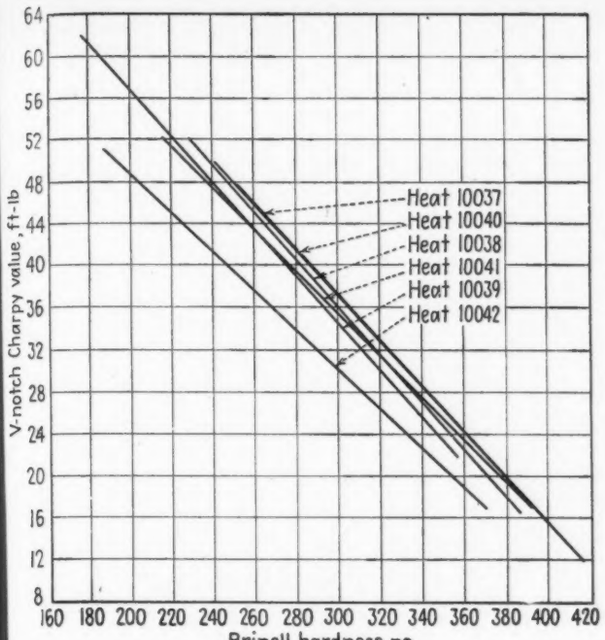


FIG. 20—A comparison of the "lines of regression" for the V-notch Charpy values of each heat, tested at room temperature.

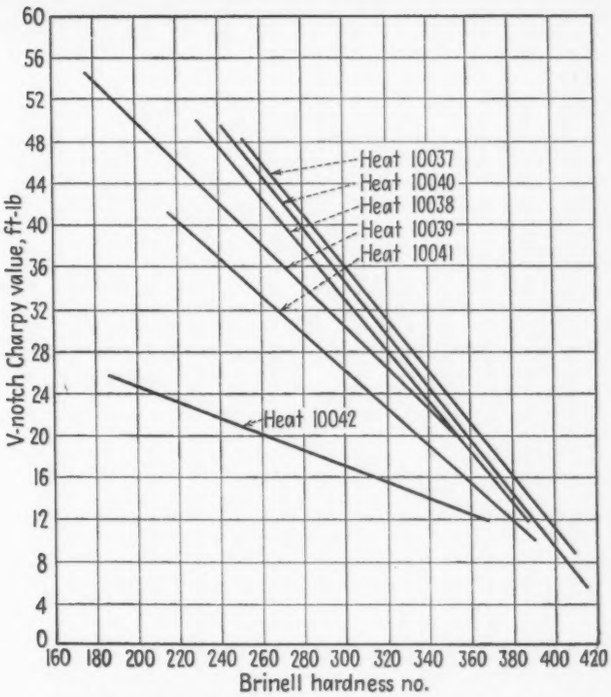


FIG. 21—A comparison of the "lines of regression" for the V-notch Charpy values of each heat, tested at —40°F.

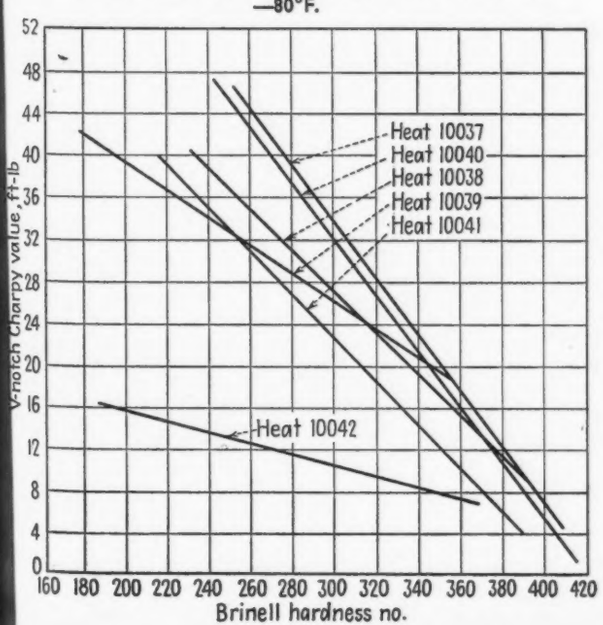
that all the values for specimens from heat 10042 fall below the line of regression for heat 10037 (fig. 18). Thus it appears that water quenching from the tempering temperature and use of short temper periods should not be thought of as a complete cure for temper brittleness. The best results and, at the same time, the most consistent results were obtained from steels not subject to temper brittleness. Efforts to correct for temper brittleness by use of special temper practices seem to be, at the most, only a means of making the best of a bad situation. If one is concerned only with room temperature properties, use of a quench after tempering and use of short tempering times may give results that are comparable to the results achieved for

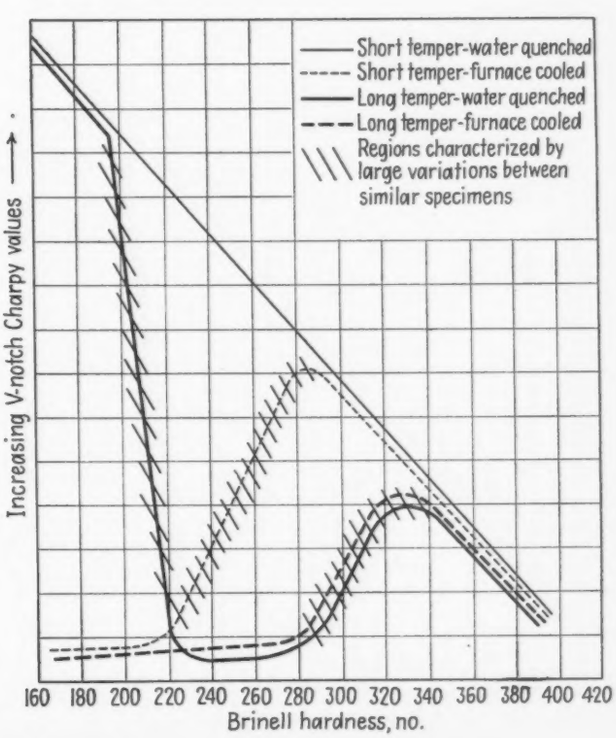
RIGHT

FIG. 23—Idealized plot of the behavior of a steel quite susceptible to temper brittleness.

BELOW

FIG. 22—A comparison of the "lines of regression" for the V-notch Charpy Values of each heat, tested at —80°F.





a steel not subject to temper brittleness, but at subzero testing temperatures, even adoption of a special temper practice does not insure that notch-bar values will become equal to the values obtained for a steel that is not susceptible to temper brittleness.

No consistent trend is evident among the specimens which received the 24-hr seasoning treatment. Therefore, it is concluded that, at least for the particular steels tested, the use of a seasoning treatment after the tempering treatment affords no advantages.

Conclusions

All six steels exhibited a very good correlation between brinell hardness and either tensile strength, yield point, elongation or reduction of area. An equally good correlation was observed between V-notch Charpy values and brinell hardness for steels not susceptible to temper brittleness. However, the V-notch Charpy v. brinell hardness correlation was poor for those steels that were subject to temper brittleness.

The results indicate that tempering practice did not affect tensile strength, yield point, elongation or reduction of area, except insofar as it simultaneously affected the hardness. The Charpy values obtained for the two heats not subject to temper brittleness (heats containing 0.40 pct Mo) were observed to correlate with brinell hardness almost as well as the tensile strength. The two heats most susceptible to temper brittleness were observed to give less consistent Charpy values. One-half hour tempers followed by water quenching produced the highest Charpy values for heats subject to temper brittleness, but even with the use of such a temper practice, the Charpy values for the heats subject to temper brittleness correlated

TABLE V

Average Deviation From the Lines of Regression

Values listed express deviations from average values and have been calculated by the method of least squares. The minus sign indicates values falling below the average; omission of plus sign indicates values above the average.

	Specimens Water Quenched From Temper						Specimens Furnace Cooled From Temper					
Heat No.	10037	10038	10039	10040	10041	10042	10037	10038	10039	10040	10041	10042
Tested at Room Temperature, Values in Ft-lb												
Effect of tempering time (900°, 1000°, and 1100°F)												
0.5 hr	− 0.2	− 0.6	0	− 1.0	1.0	3.7	− 2.2	− 0.7	− 0.7	− 0.3	2.7	− 4.0
2.0 hr	0.3	− 0.3	1.0	− 0.7	0.7	4.7	1.8	0.3	− 3.0	0.3	1.0	− 1.0
8.0 hr	0.2	0.3	0.3	− 2.0	− 2.0	− 3.7	− 0.3	− 1.7	− 1.4	1.3	− 1.0	− 1.4
32.0 hr	− 0.6	− 0.3	− 2.6	0	− 1.0	− 7.7	− 0.6	− 0.3	− 1.4	− 0.7	− 2.7	0.6
Effect of tempering temperature												
800°F	0.3	2.8	2.8	0.5	2.5	2.3	− 0.4	0	0	− 1.0	− 0.8	0
900°F	0.6	− 0.3	− 1.5	0	− 1.3	− 4.5	0.6	− 2.0	− 1.8	− 2.0	0	− 0.7
1000°F	0.8	0	2.3	− 0.3	− 1.3	− 3.5	0.3	− 0.5	− 3.5	1.0	− 1.6	− 3.5
1100°F	− 1.4	− 0.5	− 1.8	− 2.5	1.5	− 1.3	− 2.0	0.8	0.5	1.5	1.5	0
1200°F	0.6	1.8	2.8	1.3	2.5	11.8	0.5	1.0	1.2	0.3	− 2.0	− 2.8
Tested at —40°F, Values in Ft-lb												
Effect of tempering time (900°, 1000°, and 1100°F)												
0.5 hr	1.0	2.0	2.7	2.0	6.0	7.3	− 1.0	− 1.0	1.0	− 0.7	− 4.7	0.3
2.0 hr	1.2	1.0	2.3	2.7	6.7	9.3	0	− 0.7	− 0.4	− 1.6	− 2.6	− 3.0
8.0 hr	1.0	− 1.7	− 3.7	− 0.3	4.0	− 7.0	1.8	0.3	− 4.3	− 1.3	− 3.7	− 8.7
32.0 hr	− 1.3	− 0.3	− 4.3	− 2.3	−18.3	−12.7	− 0.8	− 0.3	− 3.3	− 0.3	4.7	3.3
Effect of tempering temperature												
800°F	− 0.8	1.5	− 0.3	− 0.8	1.0	1.0	− 1.5	− 1.0	− 1.8	− 0.5	− 3.5	− 3.0
900°F	0.1	− 0.5	− 2.0	− 1.3	0.5	1.3	− 0.6	− 0.5	− 0.5	− 3.3	1.8	− 0.7
1000°F	1.4	2.0	2.0	4.3	0.3	0.5	0.6	− 1.2	− 4.5	0.4	− 7.0	1.5
1100°F	− 0.1	− 0.8	− 2.3	− 1.5	− 2.0	− 4.0	− 0.6	0.5	− 0.3	1.0	0.5	− 5.3
1200°F	− 0.1	1.5	5.3	1.5	10.8	25.5	− 0.6	− 0.3	− 4.2	− 1.0	2.7	−11.0
Tested at —80°F, Values in Ft-lb												
Effect of tempering time (900°, 1000°, and 1100°F)												
0.5 hr	0.2	3.3	6.3	− 0.7	3.7	10.0	0.3	− 0.4	0.7	− 0.7	− 5.6	− 0.7
2.0 hr	1.3	1.7	6.7	0.3	7.0	4.7	− 1.5	1.0	− 1.6	− 1.0	1.3	− 3.3
8.0 hr	1.8	3.0	− 4.7	0.3	−15.3	− 6.3	0.8	− 1.3	− 1.0	0.3	1.7	0.7
32.0 hr	− 0.5	− 0.7	− 4.7	− 2.0	− 8.0	− 9.7	− 2.5	1.0	− 2.4	− 1.3	0	− 8.3
Effect of tempering temperature												
800°F	0.1	0.5	− 1.0	3.5	2.8	0	0.1	− 2.5	− 3.7	0	− 2.7	− 1.5
900°F	0.6	− 0.3	3.8	− 1.0	0	− 0.5	− 2.2	− 2.3	2.0	− 1.8	0.8	− 1.3
1000°F	1.0	3.3	4.0	0.8	1.0	1.8	0.4	− 2.2	− 1.0	− 1.7	− 5.0	− 5.2
1100°F	0.5	2.3	− 5.0	− 1.3	−10.5	− 2.3	− 0.9	4.8	− 4.0	1.5	2.3	− 2.3
1200°F	1.8	2.5	11.0	3.0	11.3	25.3	− 0.6	0	− 2.5	0.7	0.5	−12.0

less with brinell hardness than did the values of heats not subject to temper brittleness. Furthermore, when the testing was done at —40°F and —80°F, none of the Charpy values for the 0 pct Mo heats equaled the values for the 0.40 pct Mo heats when compared at the same hardness.

Acknowledgment

Acknowledgment is made to the Office of Scientific Research and Development for its support and permission to publish this work, to the War Metallurgy Div. of NDRC, to the War Metallurgy Committee for supervising and directing the research, and to various members of the Battelle Staff, particularly C. H. Lorig, P. C. Rosenthal, and M. K. Barnett, for their helpful contributions.

It was observed that two heats not subject to temper brittleness, when tempered to any specified hardness within the range of 200 to 400 Bhn by a variety of practices, possessed equivalent mechanical properties.

References

References 1 to 3 will be found with the first part of this two-part article.

[4] Greaves, R. H., "Temper Brittleness of Nickel-Chrome Steel," Journal Iron and Steel Institute, **100**, No. II, 1919, pp. 329-339.

[5] Greaves, R. H., Fell, M., and Hadfield, Sir. R., "Further Communications of Temper Brittleness of Nickel-Chrome Steel," Journal Iron and Steel Institute, **100**, No. II, 1919, pp. 340-348.

[6] Greaves, R. H., and Jones, J. J. A., "Temper Brittleness of Nickel-Chromium Steels," Journal Iron and Steel Institute, **102**, No. II, 1920, pp. 171-222.

[7] Greaves, R. H., and Jones, J. J. A., "Temper Brittleness of Steel; Susceptibility to Temper Brittleness in Relation to Chemical Composition," Journal Iron and Steel Institute, **3**, No. I, 1925, pp. 231-255.

[8] Greaves, R. H., "The Properties of Some Low-Nickel Steels Containing Manganese," Journal Iron and Steel Institute, **132**, No. II, 1935, pp. 99-116.

[9] Burns, G., "The Effect of Molybdenum on Medium Carbon Steels," Journal Iron and Steel Institute, **124**, 1931, pp. 252-255.

[10] Nagasawa, K., "On the Temper Brittleness of Steel," Tsetsu-to-Hagane, **19**, March 1933, pp. 174-196; English Translation, K. Honda, Metal Progress, **23**, 1933, pp. 43-44.

[11] Houdremont, E., and Schrader, H., "Temper Brittleness," Arch. für das Eisenhuttenwessen, **7**, 1933, pp. 49-59.

[12] Hurst, H. E., "Temper Brittleness in Cast Iron and the Influence of Nickel and Molybdenum," Foundry Trade Journal, **53**, 1935, pp. 372-373.

[13] Jones, J. A., "Temper Brittleness in Alloy Steels," Metal Treatment, **4**, Autumn, 1938, pp. 97-101.

[14] Kishkin, S. T., "The Mechanism of the Effect of Molybdenum and Columbium on the Temper Brittleness of Steels," Bull. Acad. Sci. U.S.S.R. Classe. Sci. Tect., No. 4, pp. 91-94. (Abstracted in Alloy Metals Review, **3**, No. 24, June 1942.)

New Mill Motors Feature Higher Ratings

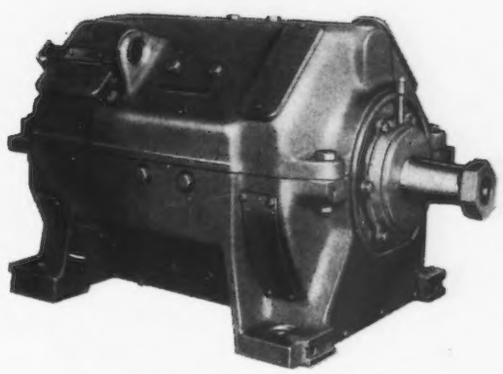
FEATURING increased horsepower in smaller space, a new line of dc armored mill motorsfi type MD-600, has been announced by the motor division of the General Electric Co. The new motors, which will ultimately replace the GE type MD-400 mill motors, have been designed in ratings from 5 to 200 hp. One of the new motors (type MD-612-AE) is shown in the accompanying illustration.

Solid roller bearings, close coupled, are used throughout the new line, permitting greater load carrying capacity. Adaptability of the frame to various enclosures allows easy changeover between protected, totally enclosed, or separately ventilated types. All existing AISE ratings pertaining to horsepower, speed, temperature, and mounting dimensions have

See "Mill Type Motor Standards" report of Assn. of Iron & Steel Engineers, THE IRON AGE, *Oct.* 10, 1946, *p.* 73-74.

been maintained, but the next larger rating will be obtained in the present frame size.

Reduction in size per hp has been accomplished by better utilization of space inside the machine, particularly around the bearing heads, and the use of glass insulation, which requires less space than asbestos. This insulation material also allows an increase in size of the current carrying conductor, and conducts heat better than asbestos.



A redesigned internal ventilation system carries heat from the armature more efficiently for rapid dissipation. Increased overload capacity is provided by improved electrical design of the armatures and careful proportioning of armature slots and commutating poles. For ground insulation, high temperature silicone resin varnish is used as a binder for the mica on the armature coils. A wide band of sparkless commutation beyond 200 pct load allows the motor to be used under severe operating conditions.

Extruded Magnesium Tubing Specifications

A NEW specification, No. B 217-46T, covering four types of extruded magnesium tubing have been announced by the American Society for Testing Materials. The new specifications cover four types of alloys, three carrying aluminum ranging from 2.5 to 9.5 pct, respectively, and the fourth being a manganese composition with a minimum of 1.2 pct Mn. The tensile requirements for the aluminum-bearing alloys range from 34,000 to 38,000 psi, while the fourth alloy has a minimum of 28,000 psi. Copies of this new specification are available from the society's office at 1916 Race St., Philadelphia, at 25c a copy.

a steel not subject to temper brittleness, but at subzero testing temperatures, even adoption of a special temper practice does not insure that notch-bar values will become equal to the values obtained for a steel that is not susceptible to temper brittleness.

No consistent trend is evident among the specimens which received the 24-hr seasoning treatment. Therefore, it is concluded that, at least for the particular steels tested, the use of a seasoning treatment after the tempering treatment affords no advantages.

Conclusions

All six steels exhibited a very good correlation between brinell hardness and either tensile strength, yield point, elongation or reduction of area. An equally good correlation was observed between V-notch Charpy values and brinell hardness for steels not susceptible to temper brittleness. However, the V-notch Charpy v. brinell hardness correlation was poor for those steels that were subject to temper brittleness.

The results indicate that tempering practice did not affect tensile strength, yield point, elongation or reduction of area, except insofar as it simultaneously affected the hardness. The Charpy values obtained for the two heats not subject to temper brittleness (heats containing 0.40 pct Mo) were observed to correlate with brinell hardness almost as well as the tensile strength. The two heats most susceptible to temper brittleness were observed to give less consistent Charpy values. One-half hour tempers followed by water quenching produced the highest Charpy values for heats subject to temper brittleness, but even with the use of such a temper practice, the Charpy values for the heats subject to temper brittleness correlated

TABLE V

Average Deviation From the Lines of Regression

Values listed express deviations from average values and have been calculated by the method of least squares. The minus sign indicates values falling below the average; omission of plus sign indicates values above the average.

	Specimens Water Quenched From Temper						Specimens Furnace Cooled From Temper					
Heat No.	10037	10038	10039	10040	10041	10042	10037	10038	10039	10040	10041	10042
Tested at Room Temperature, Values in Ft-lb												
Effect of tempering time (900°, 1000°, and 1100°F)												
0.5 hr	− 0.2	− 0.6	0	− 1.0	1.0	3.7	− 2.2	− 0.7	− 0.7	− 0.3	2.7	− 4.0
2.0 hr	0.3	− 0.3	1.0	− 0.7	0.7	4.7	1.8	0.3	− 3.0	0.3	1.0	− 1.0
8.0 hr	0.2	0.3	0.3	− 2.0	− 2.0	− 3.7	− 0.3	− 1.7	− 1.4	1.3	− 1.0	− 1.4
32.0 hr	− 0.6	− 0.3	− 2.6	0	− 1.0	− 7.7	− 0.6	− 0.3	− 1.4	− 0.7	− 2.7	0.6
Effect of tempering temperature												
800°F	0.3	2.8	2.8	0.5	2.5	2.3	− 0.4	0	0	− 1.0	− 0.8	0
900°F	0.6	− 0.3	− 1.5	0	− 1.3	− 4.5	0.6	− 2.0	− 1.8	− 2.0	0	− 0.7
1000°F	0.8	0	2.3	− 0.3	− 1.3	− 3.5	0.3	− 0.5	− 3.5	1.0	− 1.6	− 3.5
1100°F	− 1.4	− 0.5	− 1.8	− 2.5	1.5	− 1.3	− 2.0	0.8	0.5	1.5	1.5	0
1200°F	0.6	1.8	2.8	1.3	2.5	11.8	0.5	1.0	1.2	0.3	− 2.0	− 2.8
Tested at —40°F, Values in Ft-lb												
Effect of tempering time (900°, 1000°, and 1100°F)												
0.5 hr	1.0	2.0	2.7	2.0	6.0	7.3	− 1.0	− 1.0	1.0	− 0.7	− 4.7	0.3
2.0 hr	1.2	1.0	2.3	2.7	6.7	9.3	0	− 0.7	− 0.4	− 1.6	− 2.6	− 3.0
8.0 hr	1.0	− 1.7	− 3.7	− 0.3	4.0	− 7.0	1.8	0.3	− 4.3	− 1.3	− 3.7	− 6.7
32.0 hr	− 1.3	− 0.3	− 4.3	− 2.3	−18.3	−12.7	− 0.8	− 0.3	− 3.3	− 0.3	4.7	3.3
Effect of tempering temperature												
800°F	− 0.8	1.5	− 0.3	− 0.8	1.0	1.0	− 1.5	− 1.0	− 1.8	− 0.5	− 3.5	− 3.0
900°F	0.1	− 0.5	− 2.0	− 1.3	0.5	1.3	− 0.6	− 0.5	− 0.5	− 3.3	1.8	− 0.7
1000°F	1.4	2.0	2.0	4.3	0.3	0.5	0.6	− 1.2	− 4.5	0.4	− 7.0	1.5
1100°F	− 0.1	− 0.8	− 2.3	− 1.5	− 2.0	− 4.0	− 0.6	0.5	− 0.3	1.0	0.5	− 5.3
1200°F	− 0.1	1.5	5.3	1.5	10.8	25.5	− 0.6	− 0.3	− 4.2	− 1.0	2.7	−11.0
Tested at —80°F, Values in Ft-lb												
Effect of tempering time (900°, 1000°, and 1100°F)												
0.5 hr	0.2	3.3	6.3	− 0.7	3.7	10.0	0.3	− 0.4	0.7	− 0.7	− 5.6	− 0.7
2.0 hr	1.3	1.7	6.7	0.3	7.0	4.7	− 1.5	1.0	− 1.6	− 1.0	1.3	− 3.3
8.0 hr	1.8	3.0	− 4.7	0.3	−15.3	− 6.3	0.8	− 1.3	− 1.0	0.3	1.7	0.7
32.0 hr	− 0.5	− 0.7	− 4.7	− 2.0	− 8.0	− 9.7	− 2.5	1.0	− 2.4	− 1.3	0	− 8.3
Effect of tempering temperature												
800°F	0.1	0.5	− 1.0	3.5	2.8	0	0.1	− 2.5	− 3.7	0	− 2.7	− 1.5
900°F	0.6	− 0.3	3.8	− 1.0	0	− 0.5	− 2.2	− 2.3	2.0	− 1.8	0.8	− 1.3
1000°F	1.0	3.3	4.0	0.8	1.0	1.8	0.4	− 2.2	− 1.0	− 1.7	− 5.0	− 5.2
1100°F	0.5	2.3	− 5.0	− 1.3	−10.5	− 2.3	− 0.9	4.8	− 4.0	1.5	2.3	− 2.3
1200°F	1.8	2.5	11.0	3.0	11.3	25.3	− 0.6	0	− 2.5	0.7	0.5	−12.0

less with brinell hardness than did the values of heats not subject to temper brittleness. Furthermore, when the testing was done at —40°F and —80°F, none of the Charpy values for the 0 pct Mo heats equaled the values for the 0.40 pct Mo heats when compared at the same hardness.

Acknowledgment

Acknowledgment is made to the Office of Scientific Research and Development for its support and permission to publish this work, to the War Metallurgy Div. of NDRC, to the War Metallurgy Committee for supervising and directing the research, and to various members of the Battelle Staff, particularly C. H. Lorig, P. C. Rosenthal, and M. K. Barnett, for their helpful contributions.

It was observed that two heats not subject to temper brittleness, when tempered to any specified hardness wihin the range of 200 to 400 Bhn by a variety of practices, possessed equivalent mechanical properties.

References

References 1 to 3 will be found with the first part of this two-part article.

[4] Greaves, R. H., "Temper Brittleness of Nickel-Chrome Steel," Journal Iron and Steel Institute, **100**, No. II, 1919, pp. 329-339.

[5] Greaves, R. H., Fell, M., and Hadfield, Sir. R., "Further Communications of Temper Brittleness of Nickel-Chrome Steel," Journal Iron and Steel Institute, **100**, No. II, 1919, pp. 340-348.

[6] Greaves, R. H., and Jones, J. J. A., "Temper Brittleness of Nickel-Chromium Steels," Journal Iron and Steel Institute, **102**, No. II, 1920, pp. 171-222.

[7] Greaves, R. H., and Jones, J. J. A., "Temper Brittleness of Steel; Susceptibility to Temper Brittleness in Relation to Chemical Composition," Journal Iron and Steel Institute, **3**, No. I, 1925, pp. 231-255.

[8] Greaves, R. H., "The Properties of Some Low-Nickel Steels Containing Manganese," Journal Iron and Steel Institute, **132**, No. II, 1935, pp. 99-116.

[9] Burns, G., "The Effect of Molybdenum on Medium Carbon Steels," Journal Iron and Steel Institute, **124**, 1931, pp. 252-255.

[10] Nagasawa, K., "On the Temper Brittleness of Steel," Tsetsu-to-Hagane, **19**, March 1933, pp. 174-196; English Translation, K. Honda, Metal Progress, **23**, 1933, pp. 43-44.

[11] Houdremont, E., and Schrader, H., "Temper Brittleness," Arch. für das Eisenhuttenwessen, **7**, 1933, pp. 49-59.

[12] Hurst, H. E., "Temper Brittleness in Cast Iron and the Influence of Nickel and Molybdenum," Foundry Trade Journal, **53**, 1935, pp. 372-373.

[13] Jones, J. A., "Temper Brittleness in Alloy Steels," Metal Treatment, **4**, Autumn, 1938, pp. 97-101.

[14] Kishkin, S. T., "The Mechanism of the Effect of Molybdenum and Columbium on the Temper Brittleness of Steels," Bull. Acad. Sci. U.S.S.R. Classe. Sci. Tect., No. 4, pp. 91-94. (Abstracted in Alloy Metals Review, **3**, No. 24, June 1942.)

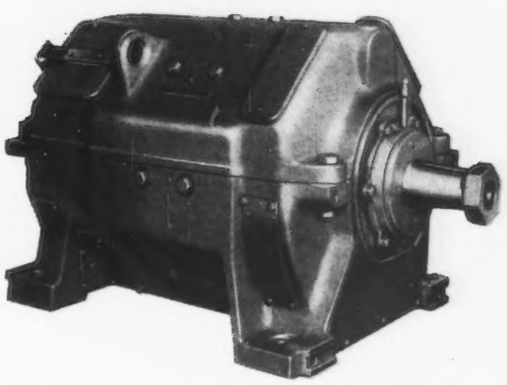
New Mill Motors Feature Higher Ratings

FEATURING increased horsepower in smaller space, a new line of dc armored mill motorsfi type MD-600, has been announced by the motor division of the General Electric Co. The new motors, which wil' ultimately replace the GE type MD-400 mill motors, have been designed in ratings from 5 to 200 hp. One of the new motors (type MD-612-AE) is shown in the accompanying illustration.

Solid roller bearings, close coupled, are used throughout the new line, permitting greater load carrying capacity. Adaptability of the frame to various enclosures allows easy changeover between protected, totally enclosed, or separately ventilated types. All existing AISE ratings pertaining to horsepower, speed, temperature, and mounting dimensions have been maintained, but the next larger rating will be obtained in the present frame size.

See "Mill Type Motor Standards" report of Assn. of Iron & Steel Engineers, THE IRON AGE, *Oct.* 10, 1946, *p.* 73-74.

Reduction in size per hp has been accomplished by better utilization of space inside the machine, particularly around the bearing heads, and the use of glass insulation, which requires less space than asbestos. This insulation material also allows an increase in size of the current carrying conductor, and conducts heat better than asbestos.



A redesigned internal ventilation system carries heat from the armature more efficiently for rapid dissipation. Increased overload capacity is provided by improved electrical design of the armatures and careful proportioning of armature slots and commutating poles. For ground insulation, high temperature silicone resin varnish is used as a binder for the mica on the armature coils. A wide band of sparkless commutation beyond 200 pct load allows the motor to be used under severe operating conditions.

Extruded Magnesium Tubing Specifications

A NEW specification, No. B 217-46T, covering four types of extruded magnesium tubing have been announced by the American Society for Testing Materials. The new specifications cover four types of alloys, three carrying aluminum ranging from 2.5 to 9.2 pct, respectively, and the fourth being a manganese composition with a minimum of 1.2 pct Mn. The tensile requirements for the aluminum-bearing alloys range from 34,000 to 38,000 psi, while the fourth alloy has a minimum of 28,000 psi. Copies of thi new specification are available from the society's office at 1916 Race St., Philadelphia, at 25c a copy.

Automatic Press Feeder Prevents Accidents

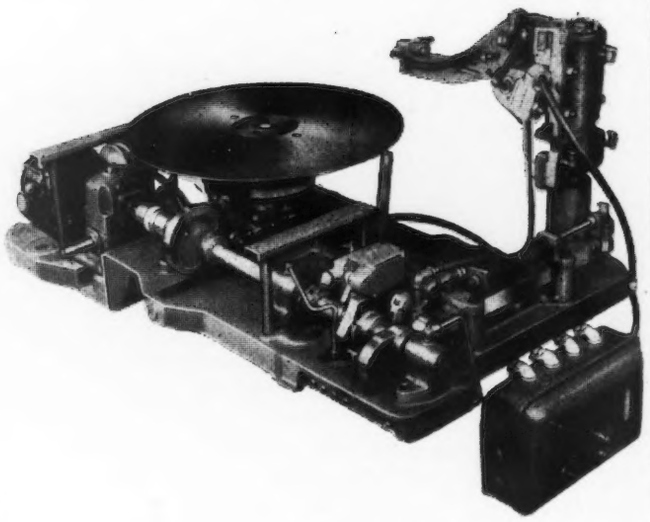


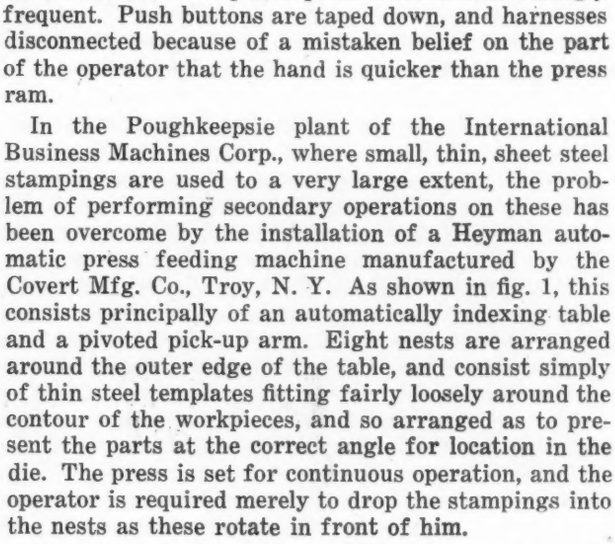
FIG. 2—Heyman press feeder with cover removed to show the arrangement of the motor-driven camshaft which controls the entire operation sequence.

DESPITE a multitude of safety devices ranging from two-handed push buttons to harnesses that mechanically pull the operator's hands away from the dies, accidents with punch presses are still alarmingly frequent. Push buttons are taped down, and harnesses disconnected because of a mistaken belief on the part of the operator that the hand is quicker than the press ram.

In the Poughkeepsie plant of the International Business Machines Corp., where small, thin, sheet steel stampings are used to a very large extent, the problem of performing secondary operations on these has been overcome by the installation of a Heyman automatic press feeding machine manufactured by the Covert Mfg. Co., Troy, N. Y. As shown in fig. 1, this consists principally of an automatically indexing table and a pivoted pick-up arm. Eight nests are arranged around the outer edge of the table, and consist simply of thin steel templates fitting fairly loosely around the contour of the workpieces, and so arranged as to present the parts at the correct angle for location in the die. The press is set for continuous operation, and the operator is required merely to drop the stampings into the nests as these rotate in front of him.

The machine is synchronized with the press flywheel at a 1 to 3 ratio and operates by means of a fractional horsepower motor and camshaft as shown in fig. 2. One of the cams indexes the feed table, a second swings the feed arm backward and forward, a third raises and lowers the arm, a fourth activates the vacuum pick-up mechanism, and the fifth trips the press. It is thus impossible for any one of these functions to occur out of their proper order. Through an arrangement of micro switches, the machine determines if there is any obstruction in the die that would cause a jam if the ram descended. In case there is, the machine shuts off, and since it controls the tripping of the press, the ram will not descend.

FIG. 1—Installed in the plant of a large Eastern manufacturer, this Heyman press feeder combines a 50 pct production increase with a 100 pct safety record.



The pick-up arm may operate either by straight suction or by means of mechanical fingers, and will not only determine if a piece has been improperly placed on the table so that if fed into the die it would become scrap, but can also be made to feel the upper die for a piece that has become stuck or to determine if a station has been left empty if this condition would cause damage should the ram descend on an empty die.

As an additional safety precaution, a transparent plastic shield is installed in front of the die, making it impossible for the operator to place his fingers anywhere within the danger zone. This has been removed in fig. 1 for the sake of clarity. Removal of the workpiece from the die is effected by a powerful jet of compressed air which blows it into a chute at the rear of the machine. In order to prevent breakage of the device, IBM has also installed a mechanically operated striker arm which would force the feed arm out of the way of the ram in the event that it should fail to clear of its own accord due to mechanical breakdown. It has, however, been in operation for well over a year and has not yet been called upon to function.

Although the device was installed originally as a safety measure, it has also had the effect of increasing production on one particular part from 1100 to 1800 pieces an hr, while requiring noticeably less effort on the part of the operator.

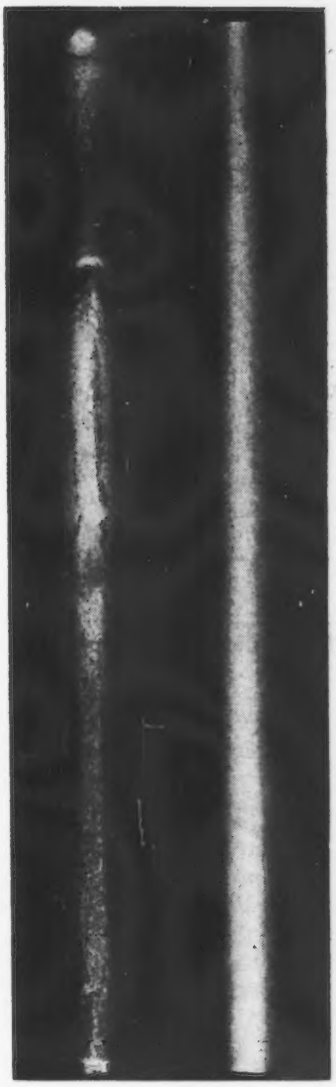
Inert-Arc Welding

The Inert-Arc welding process, recently developed by General Electric, makes use of a tungsten electrode and a shielding stream of helium or argon gas around the arc. The technique of applying the process to aluminum, magnesium, and stainless steel is described herein.

o o o

By R. F. WYER
Electric Welding Div., General Electric Co., Schenectady

o o o



o o o

FIG. 1 — Consumption of the tungsten electrodes is practically negligible. The 3/16-in. electrode on the right was never used, the one on the left operated continuously for over 2 hr with currents from 200 to 285 amp ac.

SOMEWHAT akin to the more familiar atomic hydrogen welding process, in that it makes use of a shielding gas, and is applied principally to thin metals, GE's new Inert-Arc welding process was developed by Hobart and Devers in the course of research work on the electric arc in various gases and vapors.

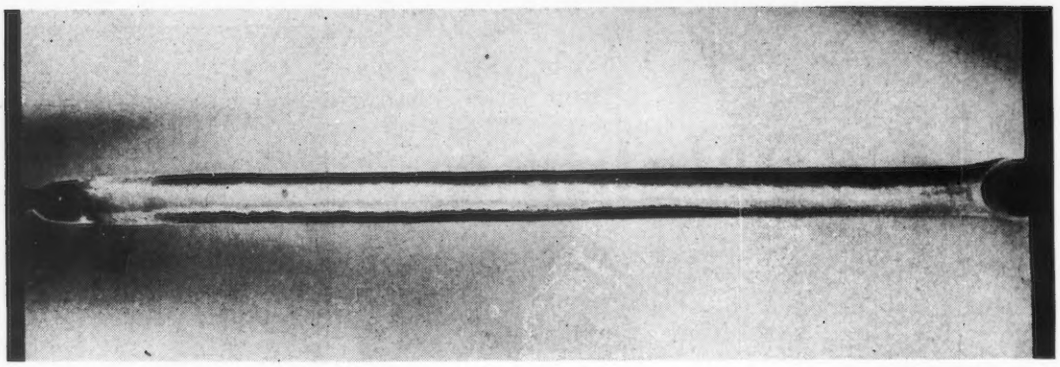
While probably the first commercial use of Inert-Arc welding was for welding magnesium (without fluxing the weld) in the form of castings and wrought shapes and plates, the present interest in the process centers largely around stainless steel, aluminum, copper, thin mild steel, and numerous special alloys such as beryllium-copper, and fernico (iron-nickel-cobalt alloy used for metal-glass gastight seals).

Inert-Arc welding employs a single electrode, usually of tungsten, held in an electrode holder which projects a smooth, low-velocity stream of helium or argon gas around the electrode and arc. The arc is very quiet, and the tungsten consumption extremely low, see fig. 1. While most applications, to date, have not required the addition of filler metal to the joint, it can be added by means of a filler rod, as in gas welding.

Both ac and dc arcs are used with the Inert-Arc process. The dc arc is preferable for all metals thus far welded, except aluminum, magnesium, and beryllium-copper. This is because the helium or argon-shielded tungsten arc shows a marked polarity, or rectifying property. When operated on dc, this is manifest as unequal heating at the two ends of the arc. With electrodes negative (straight polarity) the electrode runs cool and the work hot—a desirable condition. If the polarity is reversed (electrode positive), much less heat is liberated at the work (with the same welding current) and the electrode runs very hot. Usually this results in melting the end of the tungsten off into the work, unless a larger electrode is used, and the latter is undesirable because it cuts down the operator's visibility and the arc tends to wander. Where it can be used with straight polarity, dc should be used.

On magnesium, however, reverse polarity must be used if dc is employed, see fig. 2. Here, ac has the advantage of reduced heating of the electrode. Straight polarity would be even better from the point of view of heating, but will not produce a good weld.

Today the largest field for Inert-Arc welding with ac is in aluminum fabrication. Equipment, is at present, being developed to do this work with a special circuit which does not require high-frequency, high-voltage, pilot-spark units for stabilization. In the meantime, there have been a limited number of successful installations of equipment stabilized by the use of unusually high-recovery voltages, such as 200 v. These equipments are not being exploited commercially because they are better suited for laboratory work and jobs where early installation of equipment is essential,



o o o

FIG. 2—This butt joint in 1/4-in. magnesium was welded at 6 hpm, using a helium shielded arc, 135 amp dc, and reverse polarity. Notice the extraordinary smooth appearance of the weld.

o o o

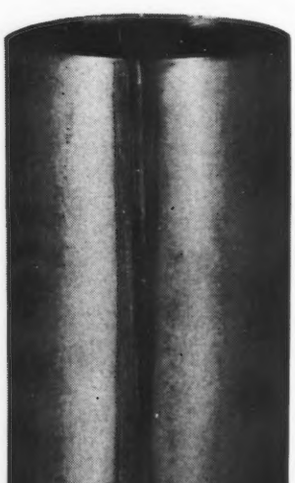
than for the run-of-the-mill production welding.

While the use of low-voltage ac circuits with superimposed high-voltage, high-frequency stabilization has been proposed for welding aluminum, the probability of troublesome radio interference from the spark gap argues strongly against their general adoption. Experience with such circuits in metal arcwelding, and with diathermy machines operating on the same principle, indicates the virtual impossibility of successfully shielding against this radio interference.

In dc Inert-Arc welding, stainless steel offers a large and favorable field. Both manual welding and machine welding with automatic heads for controlling arc length are producing excellent results at the present time. Speeds as high as 40 in. per min on 1/16-in. stock have been obtained in machine welding, with full penetration, and excellent contour on both the front and back of the weld. The relatively low first cost of the equipment, the closely concentrated zone of heating (sometimes indicated by the term cold arc) and reduction of warping, added to the good appearance and quality of welds produced, make the use of Inert-Arc welding particularly attractive in light gage stainless steel fabrication. See fig. 3.

Either helium or argon can be used in welding stainless steel, the choice usually depending on availability and delivered cost. In the case of low-current welding on very thin stock (for example, 30 amp on 0.025-in. stock), argon has the advantage of better arc stability. This makes it easier to strike and maintain the arc, because the argon arc has lower voltage than the helium arc, and permits the use of higher current without burning through the work. Both the lower voltage and the higher current contribute to improved arc stability. See fig. 4.

The use of ac with high-frequency stabilization appears to have no advantage in welding stainless steel. By comparison, dc shows a lower first cost of equipment, and better distribution of heat—more on the work and less on the electrode. Standard single operator dc arcwelders are used, usually in 200 or 300 amp ratings, at current levels ranging from 40 to 50 amp.



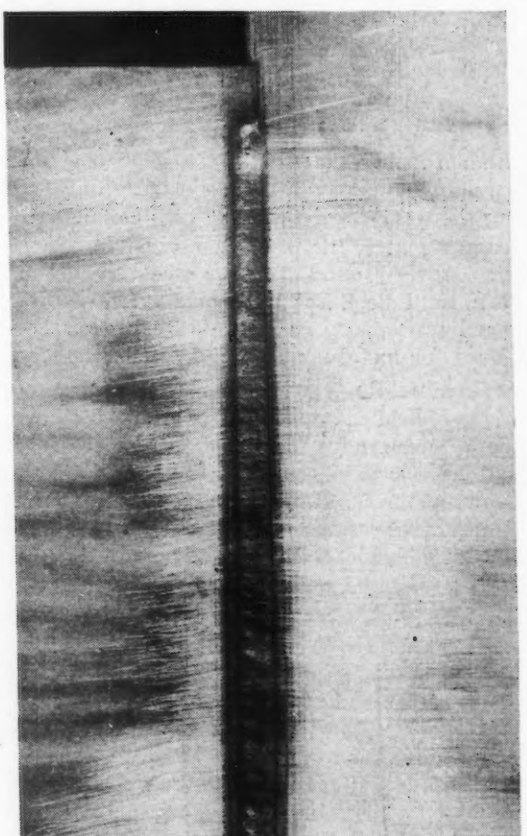
LEFT

FIG. 3—Type 347 columbium stabilized 18-8 stainless steel tubing 0.050-in. thick, welded at about 60 ipm with an automatic head. Helium gas was used with dc, straight polarity.

o o o

RIGHT

FIG. 4—Weld made in 0.025-in. stainless steel sheet, using a dc argon shielded arc. Plates were lapped about 1/32 in. as shown at top, to overcome difficulties in line-up and distortion.

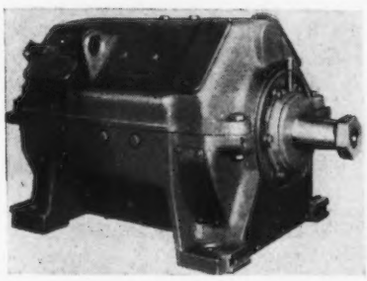


New Equipment . . .

Power Transmission

Recent developments in electric and hydraulic motors, speed drives and reducers, voltage regulators, transformers, starters, rectifiers, and several miscellaneous units such as switches and contact springs are discussed in the following pages.

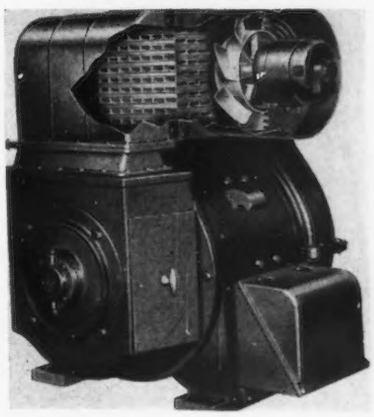
TYPE MD-600 dc armored mill motors have been announced by the *Motor Div.* of the *General Electric Co.*, Schenectady 5. Featuring increased horsepower in smaller space, and retaining the sturdy construction of the MD-400 series, they have been designed in ratings from 5 to 200 hp. Solid roller bearings, close-coupled, are used throughout the new line, permitting greater load-carrying capacity. Adaptability of the frame to various enclosures allows easy changeover between protected, totally-enclosed, or separately-ventilated types. Reduction in size per horsepower has been accomplished by better utilization of space inside the machine, particularly around the bearing heads, and the use of glass insulation. A redesigned internal ventilation system carries heat from the armature



more efficiently for rapid dissipation. Increased overload capacity is provided by improved electrical design of the armatures and careful proportioning of armature slots and commutating poles.

Unit-Cooled Motors

UNIT-COOLED totally enclosed, direct-current motors especially designed for operation in severe atmospheric conditions such as prevail in steel mills, cement and paper mills and coal and coke plants have been announced by the *General Electric Co.*, Schenectady 5. The new motors are available in sizes 15 to 200 hp at popular speeds and voltages. A unique feature of the motor is the dual ventilating system, which utilizes a compact unit cooler operating on a principle



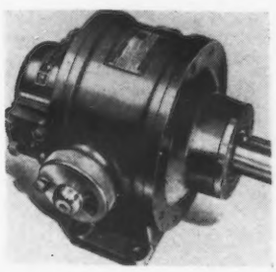
similar to that of an automobile radiator except that air instead of water is used for cooling. A thermostatic relay located in the airstream of the enclosed system protects the main motor in case of failure of the auxilary motor power supply or accidental restriction of the air intake. The new motors can be furnished with either ball or sleeve-type bearings, depending upon service requirements. Constant speed motors are available with shunt, stabilized shunt or compound windings. Adjustable speed ratings are shunt or stabilized shunt wound.

Variable Speed Drive

MARKETED under the name of Servotron, a variable speed drive in which speed is controlled electronically has been announced by the *Submarine Signal Co.*, 160 State St., Boston 9. This drive operates on ac and through an electronic controller runs a dc motor at speeds which are infinitely variable within the motor's speed and load capacity, maintaining, it is said, uniform torque over the entire speed range. The Servotron has instantaneous dynamic braking and instant reversal without speed overrun.

Midget-Size Motor

PRODUCTION of an industrial hydraulic motor, combining high starting torque with turbine-smooth power, has been announced by *Superdraulic Corp.*, Dearborn, Mich. This development known as the Triport Motor, parallels the company's line of high pressure hydraulic pumps, making available a balanced combination of pumps and motors. This compact unit has a 47 hp motor, is 10½ in. in diam and light enough to be easily handled by one man. Torque range is as high as 200 lb-ft. The motor is available in two types, one rated at

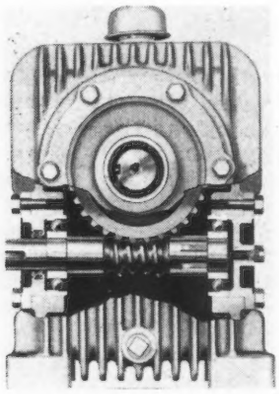


26½ gpm with 3500 psi, input at 1200 rpm; the other at 19 gpm with 5000 psi at 1200 rpm. This motor is said to provide infinitely variable speed control, forward and reverse, by means of a finger volume control valve; starts without clutches; and gives perfect control of acceleration and deceleration.

Speed Reducers

BUILT around double enveloping Cone-Drive gearing, a complete standardized line of compact speed reducers has been announced by *Michigan Tool Co.*, 7171 E. McNichols Rd., Detroit 12. The load carrying capacity of Cone-Drive gearing permits use of smaller

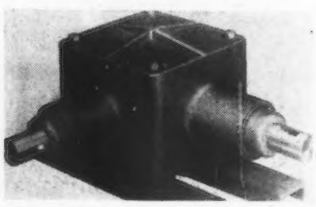
gears to transmit a given load, resulting in more compact housings and sturdiness of the units. The new line includes models with pinion under, pinion over, and with



gear shaft vertical. The center distances of from 2 to 18 in. cover a power-transmission range equivalent to 3 to 24 in. center distance in worm gearing. Standardized Cone-Drive gear sets, pinion and gear mountings are used in all models. Assemblies are either right or left hand. Available ratios range from 5:1 to 70:1.

Miter Gear Unit

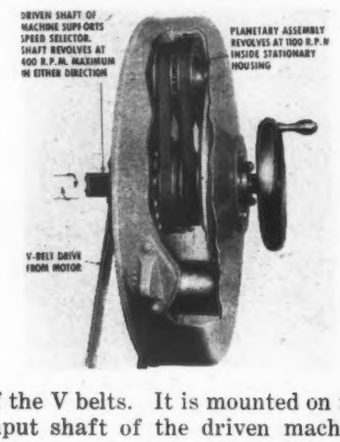
DEVELOPED for slow speed and high torque for intermittent operation, such as control of oven doors, shafting at right angles, valves, etc. a miter gear unit has been developed by *Payne Dean & Co.*, Madison, Conn. The gears are of the straight bevel type with 1:1 ratio and the steel shafts operate in grease lubricated bronze bearings. The case is of cast iron with



gasketed cover and with oil seals in the bearings. The device, which is weatherproof, may be used in any operating position. Two sizes are available with a capacity of 1000 and 4000 in-lb, and for 5-min operation.

Speed Selector

DEVELOPMENT of planetary motion in which two standard cross-section V belts and four variable pitch pulleys provide infinite ratio, stepless speed, from full down through zero and into full reverse at constant torque of 2-hp capacity, has been jointly announced by *Speed Selector, Inc.*, Cleveland and the *B. F. Goodrich Co.*, Akron, Ohio. A slight change in the variable pitch pulleys of this Variable-V-Planetary speed selector brings a large change in output speed through the multiplying action of the planetary mounted on the motor or driven shaft of the machine on which it is used. In operation the speed selector system compares the ratios of two V-belt drives and applies the difference in speed to output shafts. All changes are made by a hand control wheel. which alters the pitch diameter of the center pulleys so that as one is increased the other is decreased and the change imparted to the outer pulleys by the wedging action


DRIVEN SHAFT OF MACHINE SUPPORTS SPEED SELECTOR. SHAFT REVOLVES AT 400 R.P.M. MAXIMUM IN EITHER DIRECTION
PLANETARY ASSEMBLY REVOLVES AT 1100 R.P.M INSIDE STATIONARY HOUSING
V-BELT DRIVE FROM MOTOR

of the V belts. It is mounted on the input shaft of the driven machine by a tapered collet and thus controls diameter of all four pulleys without use of springs or complex linkages.

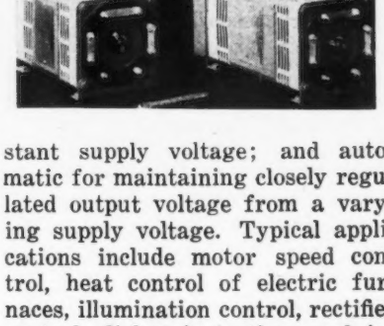
Heavy Duty Controllers

HEAVY duty dc controllers for steel mill auxiliaries, cranes and other heavy duty applications where service is severe and continuity of operation is vital have been introduced by the *Industrial Controller Div.* of the *Square D Co.*, 4041 No. Richards St., Milwaukee. These controllers are said to meet electrical standards developed by mill engineers to provide maximum performance under difficult conditions. Contactors are available with 8-hr ratings of 100, 150, 300, and 600 amp, and mill ratings of 133 pct of those values. They are said to have high rupture capacity and are rapid in operation. Pneumatic timers provide wide range, time limit acceleration unaffected by usual fluctuations in temperature, voltage and other conditions of application. Control relays are of heavy duty type, performing under-voltage, interlocking, sequencing and shunt filled control functions. Mill type over-

load relay combines inverse time thermal overload protection with instantaneous trip over-torque protection in a single device. Nonreversing controllers are available with or without dynamic braking. Reversing controllers are standard with dynamic braking, plugging, or both dynamic braking and plugging. All controllers are suitable for use with mill type master switch and can be furnished for push-button operation.

Voltage Regulators

ANNOUNCEMENT of an extended line of dry-type induction voltage regulators to include 300 and 600 v amp ratings has been made by the *Transformer Div.* of the *General Electric Co.*, Schenectady 5. Inductrols are available in two designs; hand or motor operated for providing a variable output voltage from a relatively con-



stant supply voltage; and automatic for maintaining closely regulated output voltage from a varying supply voltage. Typical applications include motor speed control, heat control of electric furnaces, illumination control, rectifier control, dielectric testing, and instrument calibrating. Inductrols operate at autotransformer efficiency, it is said, and the absence of brushes practically eliminates

radio interference. Designed for continuous operation, they have practically no effect on the power factor of the circuit in which they are used.

Combination Starters

A LINE of Hi-Fuse polarized field frequency synchronous motor controls with current-limiting fuses has been announced by *Electric Machinery Mfg. Co.*, Minneapolis 13. These general-purpose, high-voltage combination starters are suitable for general installation in industrial plants with high voltage service, and are usually applicable without necessity of engineering analysis of short circuit currents, yet provide interrupting capacity generally adequate, it is said, for all except the largest distribution systems. The Hi-Fuse control provides disconnecting means, short-circuit protection, and motor overload protection. They are furnished in voltage ratings up to 5000 v, with current interrupting capacity of 60,000 amp asymmetrical.

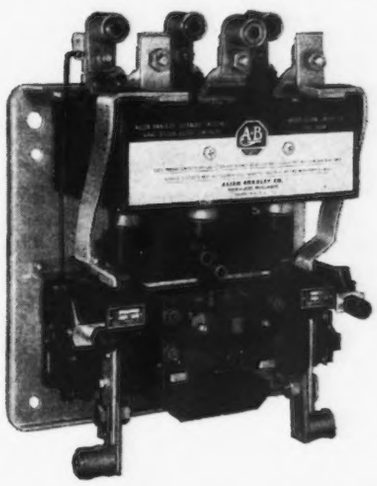
Current Transformers

TWO current transformers for meter, relay, and control device applications have been announced

by the *Meter & Instrument Div.* of the *General Electric Co.*, Schenectady 5. The JKL-3 is rated 5000 v, 1200 to 4000 amp, and is designed to withstand full-wave impulse tests at 60 kv in accordance with ASA standards, and the JKL-4, rated 8700 v, 1200 to 4000 amp, is designed to withstand full-wave impulse tests at 75 kv. Both the JKL-3 for 2400 and 4800-v lines, and the JKL-4 for 7200-v lines, have been designed for accurate metering over the normal current range up to 100 pct of rating, and also for relay operation up to 20 times rated current.

Solenoid Starter

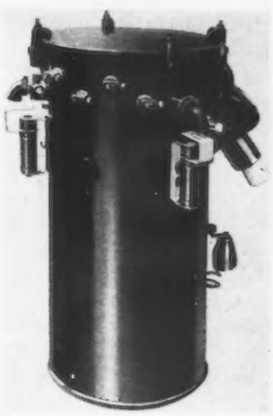
BUILT with solenoid switch structure, a large starter Size 5, Bulletin 709, has been developed by the *Allen-Bradley Co.*, 1311 S. First St., Milwaukee 4. This new unit, which has a maximum horsepower rating of 100 hp, 220 v and 200 hp, 440-550-600 v replaces the Bulletin 710, Size 5, clapper starter. All the features of the smaller solenoid starters are incorporated in the new Size 5 solenoid starter. Contact cleaning, filing, or dressing are avoided by the use of cadmium



silver contacts, which are encased in an arc hood, each pole of the switch having its individual arc chamber. Hence, starters can be closely grouped without danger of flash-over between switches. The solenoid design has reduced the size of the starter, which the wiring space has been increased. Plainly marked, accessible terminals make wiring easy. The starter is mounted on a self-insulated metal base plate, and can be provided with or without an enclosure.

Transformers

INCLUDING the advantages of loading by copper temperature and integral surge protection of CSP transformers, the CSPB transformer announced by *Westinghouse Electric Corp.*, P. O. Box 868, Pittsburgh 30, has been designed especially for banked secondary operation. This transformer differs from the standard CSP by the addition of a secondary breaker and two extra low voltage bushings for sectionalizing faulted or overloaded secondaries. When used in a banked



secondary system, they are said to reduce light flicker resulting from appliance motor load, increase service reliability and reduce necessary installed capacity. The transformers are available in the 10 kva and 15 kva sizes in standard high voltage ratings from 2400 to 14,400 v inclusive.

Portable Rectifiers

REDESIGN of a line of portable, sealed-ignitron, mercury-arc rectifiers for mining service has been announced by the *General Electric Co.*, Schenectady 5. The new equipment is a completely integrated, compact, ac to dc substation, mounted on mine-car-type wheels so that it can follow the load center as the working face moves away from the portal. Consisting of an ac switchgear car, transform-

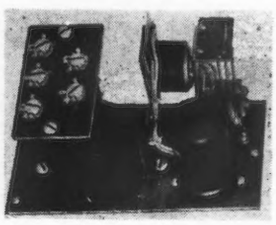
er car, and rectifier car, it is only 48 in. high. The design, available in ratings from 75 to 750 kw, gives added protection against mine dust and dirt, and increased safety for personnel. All live parts are located behind a dead front. The top of the unit is designed in sections which can be easily removed.

Selenium Rectifiers

FEATURING variable or selected dc voltage, and instantaneous power by plugging into a 110 v ac source, a line of rectifiers has been announced by the *Electro-Tech Equipment Co.*, 119 Lafayette St., New York 13. The units are convection cooled, conservatively rated, full wave bridge selenium rectifiers. Specifications are: input 115 v 60 cycles, output 12 v dc and 8 v dc, with capacities of 25, 50, and 150 amp. All models are continuously variable.

Electronic Relay

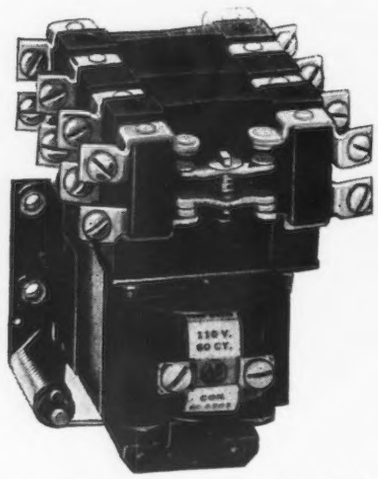
UTILIZING the hot cathode principle, a supersensitive relay for use in electrical control circuits has been announced by *Automatic Temperature Control Co.*, 34 E. Logan St., Philadelphia 44. The relay features snap action, has high load contact capacity, and trips by either an external contact



carrying only 3 micro amp or any external circuit whose value drops to 1 megohm pure resistance. Operation is from 110 v, 60-cycle ac lines. Applications for the device include: Conversion of delicate contact-making instruments into positive control devices without causing arcing or welding of electrodes; motions and limit control within micro inches on automatic feed machines; in photo-cell circuits, for direct controlling actuation of motors, valves, alarms, etc., and liquid level control.

Solenoid Relay

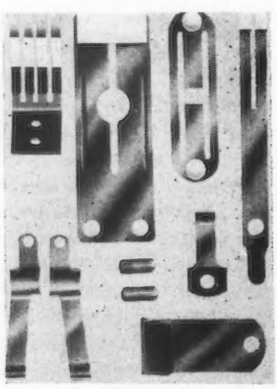
FLEXIBILITY is the outstanding feature of a line of universal type solenoid relays developed by the *Allen-Bradley Co.*, 1311 S. First St., Milwaukee 4. In these relays, which are an addition to the regular Bulletin 700 line of solenoid relays, a simple shift of connections makes it possible to change a set of normally open contacts to normally closed operation, or vice versa. They are available in 2, 4, 6, and 8-pole construction. The relays have a maximum current rating of 10 amp, noninductive, and can be obtained for operation on 25, 30, 40, 50, and 60 cycles



with voltages of 6, 12, 24, 32, 64, 110, 220, 440, 550, and 600 v. The universal type should only be used for switching circuits of like polarity and cannot be used as reversing switches.

Contact Springs

ELECTRICAL contact springs of beryllium copper have been announced by the *Gibson Electric Co.*, 8350 Frankstown Ave., Pittsburgh. They are recommended for use where exceptional spring properties combined with high electrical conductivity are required, as beryllium copper has a modulus of elas-



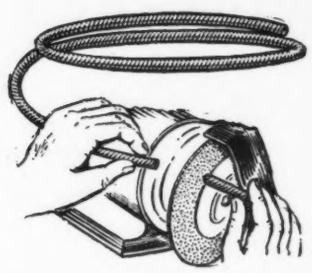
ticity of 18,500,000 and tensile strength from 175,000 to 200,000 psi. Its electrical conductivity is 25 to 32 pct IACS.

Pressure Switches

THREE pressure switches have been announced by the *Cook Electric Co.*, Chicago 14. One, the ID industrial differential switch, embodies a principle of operating two independent circuits at two selected pressures which may or may not be equal. The second, known as the SD special device switch, can be operated by any type of pressure impulse, whether gas or liquid, and the LP low pressure switch is used to control electric circuits actuated by low pressures or vacuums, either liquid or gas. The ID and SD switches operate on pressures from 1 to 17 psi, while the LP switch can be supplied to operate at pressures from 0 to 30 in. water pressure, vacuum, or both.

Flexible Shafting

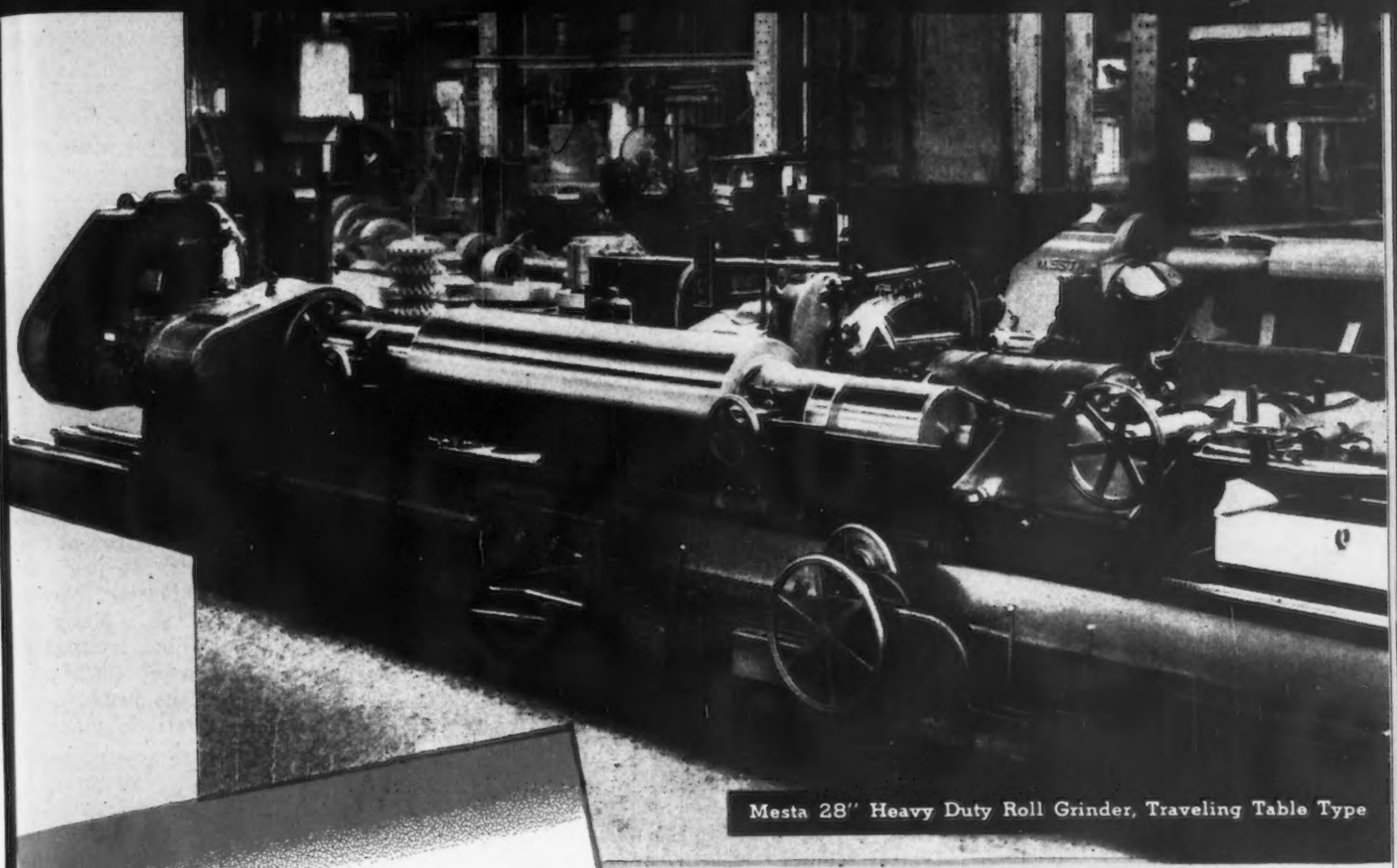
STAINLESS steel flexible shafting which is cold-wound and non-ravel and can be cut without first soldering or brazing, has been announced by the *Elliott Mfg. Co.*, 520 Prospect St., Binghamton, N. Y. Stainless steel wire is used in the outer coat or layer, around



a music wire core. It is said this stainless steel final layer outlives the music wire underneath, and the entire shaft lasts until the casing is worn out. Other advantages of the use of stainless steel are: Less heat is generated between the core and the case; little or no galling of either the shaft or casing liner occurs.

Retaining Ring

PROVIDING a large and uniformly protruding shoulder on shafts of 3/32-in. diam and over, an E shaped retaining ring, designed to withstand considerable thrust loads, has been announced by *Waldes Kohinoor, Inc.*, 47-10 Austel Pl., Long Island City 1, N. Y. Three protusions, equally spaced, form the abutments in the groove of the shaft. Recesses between the protusions make the ring sufficiently resilient to permit the necessary spread for easy, quick assembly and disassembly without permanent set.



Mesta 28" Heavy Duty Roll Grinder, Traveling Table Type

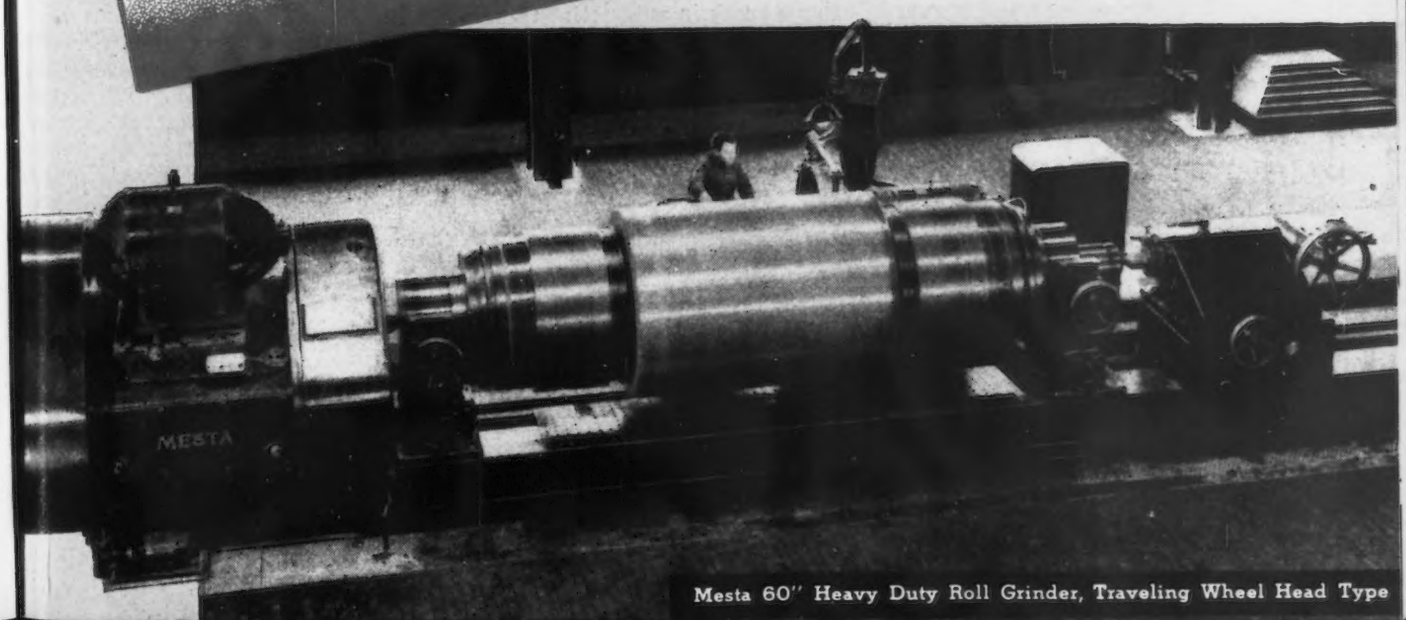
MESTA *Roll Grinders*

MESTA Roll Grinders of simplified design are the most accurate and dependable grinding machines available today. Built with precision for the finest finishing and with ruggedness for the heaviest roughing.

MESTA MACHINE CO.

PITTSBURGH, PA.

World's Leading Designers and Builders of Complete Steel Plants

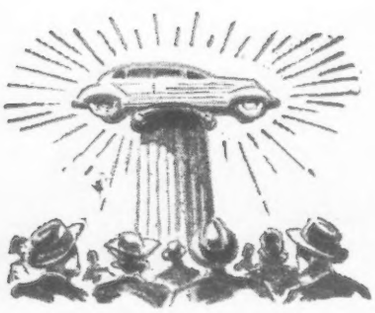


Mesta 60" Heavy Duty Roll Grinder, Traveling Wheel Head Type

Assembly Line . . .

WALTER G. PATTON

• Union is seeking an industry wage pattern in Chrysler case . . . Bundy finds solution for automobile wage problem . . . Public wrong about new car sales.



DETROIT—If only the automobile industry could turn out new model wage plans the way it turns out new model cars, Detroit would be much more optimistic as Chrysler and UAW-CIO go to the mat for a series of wage negotiations that may well determine whether the automobile industry is to have prosperity or depression during the next 2 yr.

If the union should win from Chrysler all it is contending for nationally—an increase in wages of 20¢ plus per hr, social security paid by the company, retirement pensions for the workers and a guaranteed annual wage—there is no doubt that many Detroit assembly lines would quickly grind to a halt.

The question at the moment is whether the union will require enough of a pay boost, either in the form of wages or union security concessions, to price automobiles out of a large share of the market, something many claim has already happened.

A factor easy to overlook in the present wage discussions between Chrysler and the union is that the union intends that the Chrysler settlement will establish a new wage pattern for the entire automobile industry. Thus the settlement that is reached must be acceptable to the union for the industry as a whole and not for just Chrysler alone.

One of the more subtle aspects of Reuther's plan of hitting one prominent producer at a time is that it enables the union to select a money-maker (like GM), justify its demands with this producer and then pass the wage boost down the line to other companies regardless of the ability of these companies to pay the wage increase.

UNDER present conditions, Reuther doesn't have his cherished industrywide bargaining, but he certainly has the next best thing to it as long as a contract with one prosperous automotive producer becomes, in effect, binding on practically all other automotive producers as has been the case with recent negotiations.

One of the brighter aspects of the Detroit labor picture is that one automobile supplier which found itself out of its market did find a solution to its wage problem that was satisfactory to both the union and the company and the plan is now earning a going wage plus 20¢ per hr extra for the plant workers. (Story in this issue on page 92.)

While it is not suggested that the Bundy CSS plan would be applicable to a large company like Chrysler, the plan does mark a sharp break in automotive thinking about wages and has the additional merit that it apparently satisfied. at least in the case of Bundy, the union's vigorous objection to wage incentive plans as well as the company's objection to a profit sharing plan.

No doubt the adoption of the Bundy plan was helped by the prospect that 700 workers would have lost their jobs unless a settlement was reached. But there is always the prospect that other companies in the Detroit area may be placed in the same unhappy position by the combined effects of high wage rates and low worker productivity.

It is significant to note that up to the present time the union has not displayed the same militancy and cock-sureness it exhibited just prior to the General Motors strike last year. It is also significant that the issue of "ability to pay" has been replaced by the issue "increase in the cost of living." Many observers here are now inclined to the opinion that aside from periodic outbursts in the press, negotiations will be relatively quiet.

WHILE the new wage drive by UAW-CIO has been called by the union a "fluid wage drive" because no specific wage is being demanded at the outset of negotiations it is quite clear that the union is shooting for a 20¢ per hr *minimum* increase and wants to remain in a position to ask more than this should prices run away in the process of lifting government price control.

Meanwhile, the union is as persistent as ever in insisting that "even at the present low levels of production, substantial wage increases can be paid without any increases in the prices of cars or replacement parts." Part of the union argument on this score is that labor represents only a small portion of the total cost of automobiles. Hence, argues the union, it is not proper to say that prices should be advanced 20 pct simply because wages have increased 20 pct.

The union also contends that the cost of living has increased 12½ pct between January and September, 1946, and its experts are predicting that the government price index will rise still further to 20 or 25 pct by December of this year. Thus, argues the union, any forecast at this time of the wage increase that will be necessary must be tentative and subject to revision as negotiations proceed.

Management's basic arguments in the present negotiations have not been announced publicly by Chrysler. However, some arguments that might well be used have been effectively presented in a bulletin pre-

"And there's your answer, Jim"

In a few minutes, this threading operation will be cutting production costs by increased performance . . . .

The scene below is taking place every day in plants all over the country.

The man on the right is the "Greenfield Man"—a trained field engineer with the "know-how" to get the right answer to a threading problem, and the "show-how" to pass along this information so it can be put into practical use.

Is your plant making full use of "The Greenfield Man" in your territory? *If not, and if you have a threading problem, call the "Greenfield" Man through your "Greenfield" distributor today!*

GTD GEOMETRIC

GREENFIELD

GREENFIELD TAP and DIE CORPORATION

GREENFIELD, MASSACHUSETTS

pared by Frank Rising of the Automotive & Aviation Parts Mfgrs., Inc.

According to Rising, Dept. of Commerce figures indicate that while profits of retail trade, motion pictures, radio broadcasting, alcoholic beverages and wearing apparel have all increased during 1946, the same report shows decreased profits for iron and steel, industrial machinery, motor vehicle parts and accessories, electrical machinery and other metalworking trades.

RISING points out further that the latest figures show that in all manufacturing about half of the employees received increases from 5 to 18¢ per hr since VJ-Day; some 23.4 pct received increases from 18 to 25¢; and 24 pct received none at all or less than 5¢. In non-manufacturing, nearly half have received no increases in pay since VJ-Day and another 30 pct received less than 10¢ per hr.

The true situation, Rising said, is that the favored unions have pulled part of the economy away from the rest insofar as wage and price structure is concerned and that the unions are now preparing to come in and ask for another round of substantial increases for the "aristocracy of labor" which they represent, thus throwing the national economy still further out of balance than it is at the present time.

By way of celebrating Chevrolet's 35th birthday, T. H. Keating, general sales manager, held a meeting with the press this week and during the course of the evening disclosed the results of investigations being conducted to get to the bottom of the troublesome dealer problem. Chevrolet's conclusions, based on the results of its own extensive investigations, can be summarized by saying that the public is wrong in most of the opinions it holds with respect to automobile dealers in general and Chevrolet dealers in particular.

For instance, an investigation by Chevrolet of 700 alleged black market cases supposedly involving Chevrolet dealers failed to disclose a single instance in which it could be proved conclusively that the dealer was personally involved in black market activities. The company is well aware, he said, that many Chevrolet cars find their way into the black market but it is convinced that these cars do not find their way into these markets through dealer channels.

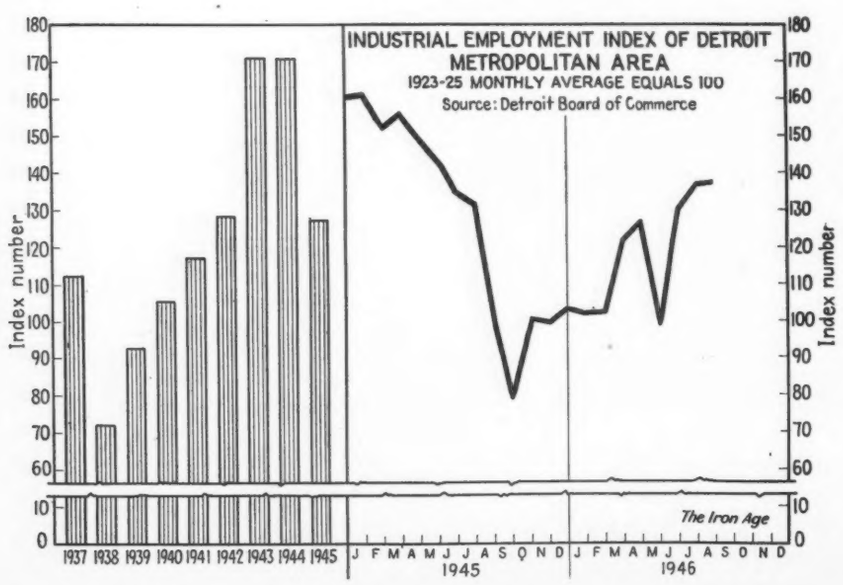
WHILE the motoring public believes almost without exception that dealers require trade-ins in order to purchase a new car, an analysis of 126,018 actual sales indicates that through August 1946, 56.8 pct of Chevrolet cars have been delivered without a trade-in.

Another misconception on the part of the public, according to Keating, is that car dealers would prefer cash deals to financed deals. From a financial standpoint, the dealer is better off if the car is financed, Keating said.

Keating also disclosed that despite rumors that the new car market appears to be softening, the bank of unfilled orders on Chevrolet books has increased steadily with each new 10-day report. There have been many cancellations, he explained, but dealers have thus far been able to replace these cancellations with prospective new car purchasers.

An analysis of new car sales by Chevrolet on a national basis through August indicates that veterans are the largest single group receiving Chevrolet cars. During this period World War II veterans have received 26.7 pct of all new Chevrolets. Other groups buying new cars are as follows: Fleet buyers 7.8 pct; public services 7.6 pct; doctors, nurses and public health officials 6.6 pct; municipal departments 5.8 pct; all others 45.5 pct.

In Mr. Keating's opinion, if a business recession comes, Chevrolet, as the lowest priced full size car available today, should be the last producer to lose its market.


INDUSTRIAL EMPLOYMENT INDEX OF DETROIT METROPOLITAN AREA
1923-25 MONTHLY AVERAGE EQUALS 100
Source: Detroit Board of Commerce
Index number
The Iron Age
1937 1938 1939 1940 1941 1942 1943 1944 1945
J F M A M J J A S O N D J F M A M J J A S O N D
1945
1946

Regional Managers Of Ford Hold Sales Talks

Detroit

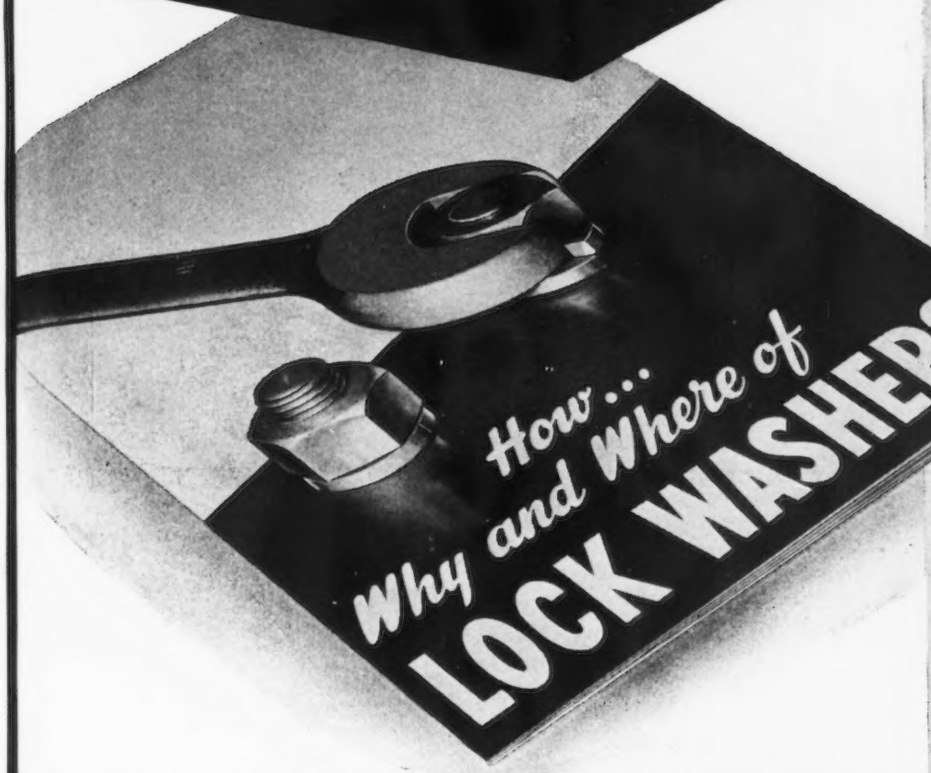
• • • **Regional managers** of the Ford Motor Co. have been called to Dearborn by J. R. Davis, vice-president and director of sales and advertising for a week's discussion of the company's present and future sales program.

The discussions will provide an opportunity for Ford regional managers to discuss their sales problems with Ford Motor Co. officials and department heads, Mr. Davis said.

Attending the session will be C. J. Seyffer, Edgewater, N. J., manager of the northeastern region; C. R. Beacham, Chester, Pa., manager of the southeastern region; Alan B. Pease, Dearborn, manager of the central region; W. K. Edmunds, Chicago, manager of the midwestern region; I. B. Groves, Kansas City, Mo., manager of the southwestern region; and A. S. Hatch, Richmond, Calif., manager of the western region.

IF YOU BUY OR SPECIFY LOCK WASHERS

GET THIS BOOK!



Spring LOCK WASHER Specification
USE SPRING LOCK WASHERS
TO COMPENSATE FOR BOLT and SCREW S-T-R-E-T-C-H-I-N-G
USE SPRING LOCK WASHERS AS BEARINGS
USE SPRING LOCK WASHERS WITH LOCK NUTS
USE SPRING LOCK WASHERS TO DEFEAT RUST AND CORROSION
USE SPRING LOCK WASHERS TO SAFEGUARD AGAINST VIBRATION

EW FACTS . . . SPECIFICATIONS . . . RECOMMENDATIONS

You should know about Lock Washers

From the latest American Standards Specifications right on through to what to use and where. That's how complete this new Diamond G Lock Washer booklet is. On the right are shown some of the pages from this new book. In addition there are many other facts that every design engineer, production manager, purchasing agent and other executive should have at his finger tips when buying or specifying lock washers or other fastening devices.

This book is just part of the complete service the Diamond G man has to offer you. He is ready to help you with data and engineering advice . . . plus supplying you with a complete line of flat and lock washers—from No. 0 to 2″ in all materials and finishes. For quick deliveries, high quality and product satisfaction write, wire or phone . . .

GEORGE K. GARRETT CO., INC.
1421 CHESTNUT STREET, PHILADELPHIA 2, PA.

SEND THIS COUPON NOW!

GEORGE K. GARRETT CO., INC.
1421 Chestnut Street, Philadelphia 2, Pa.

Please send me a copy of the NEW DIAMOND G LOCK WASHER book...

NAME_____

TITLE_____

COMPANY_____

ADDRESS_____

CITY_____

IAMOND PRODUCTS

WASHERS • • FLAT WASHERS • • STAMPINGS • • SPRINGS • • HOSE CLAMPS • • SNAP AND RETAINER RINGS

Washington . . .

L. W. MOFFETT

• NHA despite vast authority probably will fail to make good in building program . . . Demands for aluminum cause concern in industry.

WASHINGTON — Opinion is divided here as to the chances of Housing Expediter Wilson W. Wyatt succeeding in his task of providing 2.7 million homes for the nation's homeless within the 2 yr allotted. A majority believes that it is physically impossible in view of chaotic conditions to even get such a large number of units started, let alone completed. On the other hand, odds are apparently with him if energy and enthusiasm count for anything.

The dynamic, young former mayor of Louisville who holds the position of federal housing czar is plunging ahead in the job with all the singleness of purpose of a quarterback who, intent on crossing the goal line irrespective of the damage left in his wake, shakes off his tacklers and ruthlessly straight-arms all opponents. He is assisted by a well-manned information staff which issues reams of press releases on slight provocation, some of them rehashes and sometimes at variance with industry reports, extolling the progress of the housing program.

On accepting appointment, Mr. Wyatt emphasized that he could not carry on the job without the authority to make his decisions and orders stick. Through a combination of legislation and executive orders he received a grant of power that has probably never been equaled by any appointive official in the government's vast network of bureaus.

THROUGH these authorizations, he has charge of all priorities relating to building materials—and their name is legion — as well as $400 million for subsidizing production when NHA holds it expedient to step up output of various items. The sum and substance of these authorizations is that the Housing Expediter has the power to knock the heads of most government officials together and take over any job that relates to the housing problem.

Only a small proportion of the nation's industries remain untouched by these powers which are exercised with the assistance of John Small's CPA and other "emergency" bureaus and agencies, such assistance having been made mandatory. In a number of industries, however, the effects of many NHA ventures are just beginning to make themselves evident. The full impact on some will not be felt until next year.

In this respect, NHA's expanded program for fabricated housing is reaching out its long tentacles into the steel and aluminum industries. Over the coming 15 months, the NHA expects to exercise its power in negotiating guaranteed market contracts as an inducement for manufacturers to take part in the program. One such contract has been made with a Philadelphia firm for manufacture of 10,000 houses, each unit requiring about four tons of steel for structural members and walls. Another contract, now under negotiation with a New Orleans builder, involves steel walls faced with vitrified enamel.

REGULAR users of aluminum are viewing with some trepidation NHA's recent announcement of plans to issue contracts for the fabrication of 100,000 factory-built aluminum houses during 1947. They see in this move not only no prospect for relief from aluminum shortages for another year, but also a distinct possibility that their already short supplies for regular uses may be reduced still further.

Housing officials state frankly that the decision to use aluminum is based on the fact that the housing program is already scraping the bottom of the barrel insofar as steel, wood and other housing materials are concerned. All indications, they add, are that such shortages are bound to continue through 1947. Adding fuel to the flames is the NHA announcement that extrusions will be used not only in the regular aluminum houses but as substitutes for wood in window frames for conventional type homes.

Under this program, NHA aluminum requirements for 1947 are forecast at around 400 million lb. This figure is roughly divided into 343 million lb of aluminum sheet and 55 million lb for extrusions. Aluminum requirements for the housing program are expected to reach their peak during the third quarter of 1947, according to housing officials, when about 37 million lb will be needed monthly.

THE plans of NHA are particularly disturbing to manufacturers of regular aluminum products since the estimated 1947 housing requirements represent almost half the total production at the present rate. Industry generally believes that little difficulty will be encountered in meeting the extrusion needs but frankly doesn't see where the sheet aluminum is to be obtained except through big cuts in shipments to regular users, thus causing a severe impact on manufacturers of other products.

Current sheet deliveries are running at about 91 million lb a month. According to CPA figures, 44 million lb a month are already going to building material manufacturers, 18 million into household products, 15 million into heavy industries, and 7 million into military channels, bringing the total to 84 million lb. Some housing requirements are included in these figures, the agency says.

It has been estimated by an optimistic producer that the present output of sheet deliveries can be boosted by 20 million lb a month provided additional ingots can be obtained. If this could be accomplished, bringing total production to 111 million lb a month, CPA figures that diversion from regular

Turning NICKEL STEEL AT 230 S.F.P.M.

SUNOCO EMULSIFYING CUTTING OIL

"Job-Proved" under Severe Operating Conditions, Maintains Accurate Cutting Edges on Tools

When heavy cuts and heavy feeds are taken on nickel steel . . . and peak production is to be obtained . . . it is essential to maintain accurate cutting edges with long intervals between grinds.

Here is a case where a manufacturer's preference for Sunoco Emulsifying Cutting Oil is based on that type of performance.

Operation: rough-turning forged spindle
Machine: Monarch Model "M" 20" engine lathe
Surface cutting-speed: 230 feet per minute
Material: S.A.E. 2350
Depth of cut: ⅜"
Feed per revolution: .015"
Type of tool: tantalum carbide
Cutting lubricant: 1 part Sunoco to 10 parts water

Sunoco is "Job-Proved". It has won the approval of leading machine-tool builders and metal-working plants for its outstanding work in a wide variety of tough metal-cutting operations.

Outstanding lubricating, heat-absorbing, and rust-preventive qualities of Sunoco make possible longer runs between regrinds, greater accuracy, better finish, fewer rejects, and worthwhile savings in production time. A test in your own plant will convince you.

SUN OIL COMPANY • *Philadelphia 3, Pa.*
Sponsors of the Sunoco News-Voice of the Air — Lowell Thomas

SUN
SUNOCO
INDUSTRIAL PRODUCTS

users would be about 13 pct, an estimate which apparently confirms fears of industry concerning future reduced supplies.

Capacity of the aluminum industry's existing facilities is estimated at from 1.2 to 1.4 billion lb or approximately 50 pct above the current production rate, estimated at 836 million lb. Here again other shortages impose tremendous "ifs" —if sufficient labor is available, if adequate soda ash can be produced, and if more aluminum ingots can be made.

PRODUCTION of soda ash is currently running at about 4.5 million tons annually or about 15 pct under present requirements. The domestic supply of this commodity has been spread more thinly in recent years because of a variety of newly developed uses. It has been going into paints, plastics, textiles, water softeners, protective coverings of all sorts, etc.

The 4.5 million tons has been distributed heretofore among all these users with the aluminum industry receiving supplies at the rate of more than 110,000 tons annually. An additional 60,000 to 80,000 tons is needed by the aluminum industry, if it is to step up production. Until more soda ash can be produced, it is obvious that any revised distribution plan, whether by the industry or government, would be at the expense of regular users.

Hanging over producers heads is the government's power of control through allocation. Soda ash is not now allocated except through voluntary apportionment by the industry which says it can continue on an equitable basis. CPA recently agreed to continuation of this system when the industry offered to increase its present rate of delivery to aluminum producers by 1 pct of the total output or by about 45,000 lb a year.

Two factors enter the picture. One is that the industry did not make this commitment for any definite period; the other is the ever-present power of NHA to demand that CPA institute the allocation system if the housing agency should decide more soda ash should go to production of aluminum for housing.

Brightening the situation, however, is the recent approval by CPA of applications for the construction of two half-million dollar soda ash plants in Michigan. If these can be completed and placed into operation within a reasonably short time, they will go a long way in solving some of the problems of the soda ash and aluminum industries.

THE BULL OF THE WOODS — BY J. R. WILLIAMS

AH--MEMORIES! THEY PASS IN REVIEW-- ALL TH' BOYS HE STARTED IN TH' MACHINIST TRADE ON THAT OLD SHAPER--PLEASANT DREAMS, OL' BOY!
NOT PLEASANT, I DON'T THINK-- ONE BECAME A SALOON KEEPER, ONE A LAWYER, ONE A POLITICIAN, ONE'S IN TH' PEN, ONE'S A HOBO, AN' ONE'S A CARTOONUTS!
IT'S A HOODOO THAT MACHINE-- IT TURNS OUT EVERYTHING BUT MACHINISTS AND WORK!
J.R.WILLIAMS
T M REG U S PAT OFF
THE NON-PRODUCER
COPR. 1946 BY NEA SERVICE INC

N.Y. Trade Zone Makes Prewar Location Shift

Washington

• • • **The second step** in the restoration of the New York Foreign Trade Zone to its former location at Stapleton, Staten Island, has been announced by Secretary of Commerce W. A. Harriman.

An order signed by Mr. Harriman in his capacity as Chairman of the Foreign Trade Zones Board transferred operations of the New York zone from its wartime location at Piers 72, 73 and 74 in the North River back to Piers 15 and 16, Staten Island, part of the original zone.

The first move in the shift from temporary to permanent location was made last December when operations at Pier 53, North River, were transferred to Pier 16. It is expected that Piers 12, 13 and 14 will be returned by the Army by the end of 1946, and that the New York zone will be restored to its prewar capacity.

Merchandise brought into the zone may be stored, repacked, sorted, graded, assembled and reshipped to foreign points without payment of duties.

Priority Aid Assured

Washington

• • • **In reassuring** small business concerns recently that they will continue to receive priorities aid in obtaining steel under the terms of PR 28, Civilian Production Administrator, John D. Small, said that reinstitution of priorities on Oct. 1 had evidently created rumors that CPA policy outlined in the regulation had changed.

"Further aid to small business in obtaining steel will be available through CPA's announced policy to keep steel warehouses stocked with adequate supplies of virtually all steel shapes," said Mr. Small. "These warehouses received exceptionally large shipments from the steel mills during the third quarter of 1946. CPA expects to continue its policy of keeping warehouses well supplied throughout the fourth quarter.

NEW No. 150 HYDRAULIC INTERNAL GRINDER

Another Bryant Postwar Development for

large gears
large bushings
large bearings
large dies, etc.

The new No. 150 grinder is a great Bryant postwar achievement to vastly increase the internal grinding capacity of your plant. This big machine is easily controlled and produces the finest finish on gears, bushings, castings, etc., *up to 60" in diameter.* The many functional features of the new No. 150 assure extremely accurate work on a high production basis. The famous Bryant three point wheel slide suspension is basic and closely maintains wheel alignment at all times. A preloaded anti-friction cross-slide insures smooth hand and power cross feed, and a hydraulically retractable wheel slide simplifies the loading and unloading of parts. The work spindle is designed for the mounting of work fixtures on either end, and is hollow to facilitate the chucking of special spindles or long work.

In a single chucking, the new No. 150 can grind a bore, or a bore and face—the bore may be either straight or tapered. When grinding a face and straight bore the new No. 150 is particularly advantageous because it assures maintenance of squareness between bore and face. Outside diameters, or outside diameters and faces can also be finished in one chucking. A copy of the new catalog sheet giving full details is yours for the asking.

If you have internal grinding work in the range from 1/16 inch diameter bore to 60" diameter swing, Bryant has machines that will economically meet your requirements. It will pay you to—

Send for the man from Bryant.

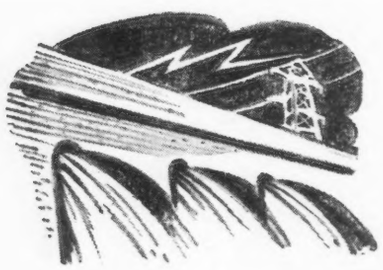
BRYANT

BRYANT CHUCKING GRINDER CO.
SPRINGFIELD, VERMONT, U. S. A.

West Coast . . . .

ROBERT T. REINHARDT

• Government bureaus assailed by western steel users for lack of understanding . . . USWA district meeting portends wage increase demands next February.



SAN FRANCISCO—Contending that the only responses obtained so far from government officials to their appeals for increased allotments of steel for the West Coast have been "evasive," "revealing a lack of understanding," and "not at all sympathetic," steel fabricators, warehousemen and jobbers are developing a mail campaign aimed at all government agencies concerned with the purpose of forcing the issue.

Particularly assailed by the warehousemen of this area is the recent telegram received by Congressman Franck R. Havenner from Wilson W. Wyatt, housing expediter, in which he indicated that West Coast consumers have been specifying shipments by rail-water and thus are forcing suppliers to absorb freight at a loss.

The telegram reads: "We are endeavoring to get increased shipments of steel to the West Coast but the steel industry advises us that consumers on West Coast specify in many cases shipment by rail-water, forcing suppliers to absorb freight at a loss. If consumers will order shipments by all rail, especially from plants located at basing points, consumer absorbs freight and shipper is more willing to accept order.

"Those consumers who have the right to place CC rated orders should place them on eastern and middle western suppliers in this manner and advise us specifically of results obtained. However, we will only follow up on cases wanting steel for the production of critical housing items. Other industry needs for steel must be taken up directly with the CPA. Consumers must allow mills reasonable delivery dates and cannot request deliveries in less than 45 days from placement of order since CPA priority regulations permit companies to reject orders if immediate delivery is specified. Letter follows."

WAREHOUSEMEN here particularly emphasize that the situation as expressed by Mr. Wyatt is far from accurate and that on the contrary, users out here are quite eager and willing to pay all rail freight if that is necessary to get the steel needed. These local men point out that a step in the right direction in this connection would be the establishment by the OPA of f.o.b. mill prices especially for sheets destined for the Pacific Coast. These steel users point out that they have no desire nor intention of upsetting the entire basing point system as it now exists but that for the duration of this emergency condition such a change in regulations would be desirable and would alleviate what is becoming a more and more serious situation.

Another suggestion by some of the larger warehousemen in this area is that rated orders of small fabricators who have been buying in less than carload lots should be grouped and presented to warehousemen who should then be authorized to extend these ratings to the mill. As matters now stand these less-than-carload buyers have no place to go because the mills are not interested and the warehouses do not have the stocks to supply them. Therefore, small sheet metal shops are caught in the middle.

John D. Small, CPA Administrator, addressed a letter to the members of Congress forming a committee endeavoring to alleviate the West Coast steel shortage in which he presented the picture of a national steel shortage as the primary cause of the local situation and gave assurance that projects under way at Pittsburg, Calif., by the Columbia Steel Co. and at Sparrows Point, Md., by the Bethlehem Steel Co. would soon offer relief.

FACTS developed locally indicate that the great white hope of these two mills doing anything of consequence to help out before the middle of next year are extremely remote. The optimistic statements put out by both of these companies for early completion of their facilities have been looked upon with considerable doubt because they too have been handicapped by material shortages and labor difficulties.

Consensus is that unless eastern mills do bring material into this area the first half of 1947 will go down in history as the "steel-less age" for California.

The complete letter of Mr. Small follows: "Reurtel Oct. 7 regarding critical steel shortage on Pacific Coast, CPA does not have detailed statistical information regarding shipments of steel to various regions of the country. However a short check of certain leading steel producers indicates that as much or more steel is now going to the three West Coast states as was shipped to these states on an average during the peacetime years of 1939, 1940 and 1941. This is especially significant in view of the fact that the steel industry lost approximately 15 million ingot tons during the earlier part of this year and of this ingot tonnage some 3 million tons of sheet and strip could have been manufactured.

"THERE is insufficient sheet steel to meet overall requirements of the nation and this shortage is not confined to any one region. The demands for sheets on the part of new business ventures and in support of the veterans housing program have resulted in less steel being available for established business concerns in all areas of the country. This shortage cannot be corrected until the new facilities now under construction result in additional production of various gages of sheet steel. As you know projects are under way or will be under way shortly at both the Columbia Steel Co. at Pittsburg, Calif., and the Bethlehem Steel Co. at Sparrows Point, Md., both of these companies being major West Coast suppliers.

NO MATTER WHAT YOUR PRODUCT MAY BE . . .

Ex-Cell-O's Complete Parts Production Facilities May Be of Practical Help to YOU!

Few people realize how extensive are Ex-Cell-O's facilities for the speedy production of quality parts. Yet the same wide experience, the engineering "know-how", and the outstanding accuracy that distinguish Ex-Cell-O machine tools and cutting tools wherever they are used . . . in many parts of the world . . . go into Ex-Cell-O's production parts manufacture.

If your product requires carefully machined parts, the chances are Ex-Cell-O can work with you to your economical advantage. Contact Ex-Cell-O today, either at the Head Office in Detroit or through any one of the 27 other leading industrial centers where Ex-Cell-O field engineering representatives are located.

Folder illustrating Ex-Cell-O's complete parts production facilities will be sent you upon request. Write or wire Ex-Cell-O today and ask for Ex-Cell-O Bulletin No. 36151.

EX-CELL-O CORPORATION • DETROIT 6

XLO
EX-CELL-O *for* PRECISION

46—14)

"We are not familiar with instances wherein mills have refused to accept rated orders properly presented to them in accordance with existing CPA regulations and if such instances are brought to our attention together with specific information and details involved, you may be sure that CPA will make prompt investigation and take corrective action.

"With regard to the proposed shutdown of the Columbia Steel Co. we have received assurance from the U. S. Steel Corp. that arrangements will be made at other producing centers to take care of orders which cannot be scheduled at the Columbia Steel Co.'s Pittsburg, Calif., plant. On this basis there will be no loss of steel for West Coast consumers as a result of a shutdown at Columbia. The records we have and the reports that we receive from all sections of the country indicate that the current shortage of light gage flat-rolled products is acute and the CPA is extending priorities assistance to steel producers to bring into being added capacity at the earliest possible moment with the purpose of alleviating the present shortage."

The most serious shortage in this area is in all grades of steel sheets and, of course, warehousemen are particularly affected because of their inability to place rated order. It is their contention that if the CPA would consult WPB records and compare those with actual shipping reports of eastern mills, the statement in Mr. Small's letter to the effect that "as much or more steel is now going to the three West Coast states as was shipped to these states on an average during the peacetime years of 1939, 1940 and 1941," would be disproved.

SEATTLE—Condemning Congress for allowing the OPA to dwindle away to a "meaningless organization," and indicating that they will insist that wage increases be introduced to "catch up with the rise in the cost of living," 150 delegates of the United Steel Workers of America (CIO), District 38, held its fifth annual convention here last week.

Claiming to represent approximately 40,000 steel workers in California, Oregon, Washington, Montana, Utah, Colorado and Arizona, the delegates made it quite clear that when the present steel workers' contract comes up for renewal in February, wages will be at the top of the list for discussion. The delegates of the 66 locals of this CIO group also discussed the possibility of having provisions in their next contract which would provide for meeting any increases in the cost of living. All of their recommendations will be presented to the union's international wage-policy committee which is charged with the responsibility of formulating the new contract to be discussed in February.

Charles J. Smith, acting district director for CIO, and James G. Thimmes, international vice-president of the union with headquarters in Pittsburgh, Pa., both charged that "Congress was knifing labor in the back by virtually destroying the effectiveness of the OPA and failing to enact the Fair Employment Practices Act." These two spokesmen went on to say that because of the laxity of Congress they were being forced to fight two battles. First, is one of collective bargaining and the second is one of political action, these men claimed. Mr. Thimmes declared "American democracy has nothing to fear if the people vote. The most important thing any union member can do this year is to vote on Nov. 5."

LOS ANGELES—In spite of steel shortages and a lack of some major component parts which have seriously affected production of industrial concerns in the West, many companies in this area are working at a high capacity.

Studebaker Pacific Corp. rolled out its first 1947 Western-built car at Vernon, Calif., this past week. "We expect to be in full production of all passenger models by Jan. 1, 1947," Stanley Whitworth, Sr., vice-president in charge of production at the Vernon plant, told THE IRON AGE. Employment of 650 is anticipated by the first of the year. The Vernon plant, used during the war for final assembly of Wright Cyclone motors for the B-17 and Pratt & Whitney engines for the Vega Ventura, has been completely reconverted for automobile production.

Northrop Aircraft, Inc., expects to keep personnel requirements on the increase through the entire year of 1947 according to Mr. LaMotte T. Cohu, general manager and chairman of the board, who stated that present production and engineering contract commitments will continue at high levels. The B-35 "Flying Wing" contract; the F-15 photo reconnaissance plane; two new experimental projects now entering the tooling stage; a new United Airlines conversion contract which entails reworking of both bi-motored and four-motored airplanes; and the newly announced "Pioneer" present dovetailed schedules of production that are expected to carry the present payroll of 4500 with additional fill-ins in the installations and assembly departments for the next 15 months to come.

Lockheed Aircraft Corp. reports a total of 132 four-engine Constellations now on order, with deliveries under present contracts scheduled to continue at a rate of two planes per week throughout 1947. Lockheed's present backlog for the Constellation was placed at $50 million.

SALT LAKE CITY—The nonferrous metals industry is sharply divided into two camps on the issue of free prices versus a subsidy program. Operators of low-cost properties want to shed the premium price plan as quickly as possible and get back on a world price basis. The high cost producers are trying to get the industry to agree upon and then unitedly support a subsidy program to take the place of the current premium price plan when the OPA Act expires.

Initiative for a new premium price set-up is coming chiefly from the Tri-State zinc and lead district. Officials of the producers' association there have been meeting with producers of Utah, Arizona, Idaho and Montana to try to sell them on the idea. Under the present premium price plan the zinc produced in that district is selling for 15.75¢ per lb, and the producers say they will have to have a slight increase to get on a sound basis when long-range development work is brought into the picture. The 15.75¢, they concede, is substantially higher than can reasonably be expected as a free world price when controls are lifted.

Some far western producers, with high cost problems of their own, are in accord with the Tri-State group. But others are cool or outright hostile to the suggestion. They take the position that those operations which cannot survive under free competition might just as well expire now as later.

NEW! QUIET!

HIGH PRESSURE - HIGH VOLUME

HYDRAULIC PUMPS

with a proved **95%** volumetric efficiency rating!...

For the first time, you can now have economical hydraulic pumps that combine *quiet operation* with *high pressure, high volume delivery.*

In the currently announced DENISON HydrOILic Pumps a total of eight revolutionary features have been incorporated. Among other features of these compact, axial piston, constant displacement pumps, is their unique ability to operate *continuously at 3500 psi*, maintaining volumetric efficiencies of 95% or better.

These DENISON HydrOILic Pumps are available in 3 models, delivering volumes ranging from 6 to 32 gpm. Write NOW for your copy of a new completely informative bulletin just off the press.

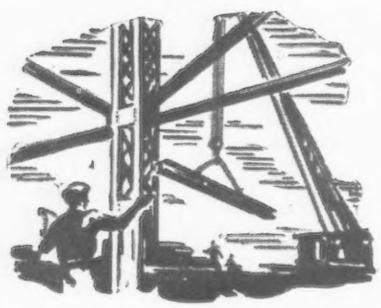
INDUSTRY'S RIGHT HAND — HydrOILics

DENISON EQUIPMENT for APPLIED HydrOILics

THE DENISON ENGINEERING CO.
1158 Dublin Road, Columbus 16, Ohio

European Letter . . . JACK R. HIGHT

• Tin Conference recommends establishment of international tin study group . . . Preparatory Committee for United Nations Trade and Employment Conference meets to draw up draft proposal for world trade agreement.



LONDON—An International Tin Conference has been held here which has reviewed the present and future world tin position, coming to the conclusion that tin production will equal demand sometime in 1949. World tin production for 1946 was estimated by the conference to be 94,000 tons against a consumption of 137,000 tons. According to the estimates, production in 1947 may be about 142,000 tons.

The conference reports that when all restrictions on the use of tin, and all production controls are lifted, world consumption may be at the rate of 190,000 tons annually. It is not expected, on the basis of the reports brought to the conference by the delegates, that world production will reach a rate of over 200,000 tons per annum until 1949, and the problem of a general excess of supply over demand is not expected to arise until some time thereafter.

The conference was held at the invitation of the United Kingdom Government, bearing in mind the fact that the existing International Tin Agreement is due to expire on Dec. 31 of this year. The proposal was to study the need for the establishment of a permanent study group to keep the international tin position under constant review.

THE resolutions adopted by the conference recommend the establishment of such an International Study Group, to include the governments represented at the conference, as early as possible. The members also voted to recommend the continuance of the Combined Tin Committee in Washington to make allocations of tin during the period of short supply. It is also being recommended that the interested countries should enter into discussions concerning the continuation of the Tin Research Institute.

Under the terms of the resolutions, the United Kingdom Government is to be invited to obtain by Jan. 1, 1947, from the governments which received invitations to the conference, their decisions regarding the establishment of a tin study group and to arrange for the first meeting.

The nations represented at the conference were: Belgium, Bolivia, China, France, the Netherlands, Siam, U.S.A., and the United Kingdom. G. Archer, chairman of the United Kingdom delegation and a member of the British Ministry of Supply, served as chairman. The U.S. was represented by D. D. Kennedy, who was one of two vice-chairmen of the conference and head of the American delegation, which included Harry Buckman, H. C. Bugbee, John C. Crostin, C. N. Gibboney, Carl Ilgenfritz, Jesse Johnson, Elmer Pehrson, and Sam Lipkowitz, secretary.

UNDER badly overcrowded conditions, the first real work of the United Nations in the field of commerce is getting under way here in London as the Preparatory Committee of the International Conference on Trade and Employment. The meeting is being held to draw up a proposal for a world trade agreement which may be presented to the representatives of the United Nations at an international conference to be held at a later date, presumably some time next year.

There are representatives of 18 nations attending the sessions which are being held in the main hall of Church House near the Parliament buildings. The general hopes of the British Government have been outlined in some detail by Sir Stafford Cripps, President of the British Board of Trade, in a welcoming speech to the committee and in a press conference held before the meeting opened.

Recalling the constant growth of all forms of trade restrictions in the period between 1918 and 1939, he stated that while they were designed to protect the individual economies of the countries concerned, the broad effect was to limit the total of world trade. Sir Stafford went into considerable detail to outline the reasons why the United Kingdom must expand its exports by 75 pct in volume over prewar, and carried this figure on to an illustration of the need for a worldwide expansion of trade rather than that of any particular country.

ACCORDING to his statistics, before the war Great Britain was responsible for roughly 20 pct of the total export trade in manufactured goods throughout the world. If the volume of manufactured goods in world export trade were to remain at the same level it was before the war, and Great Britain expanded her exports by 75 pct as she is determined to do, the British share of the total would be about 35 pct, a figure which Sir Stafford described as "quite impossible for any single country to aim at in the world manufacture of goods."

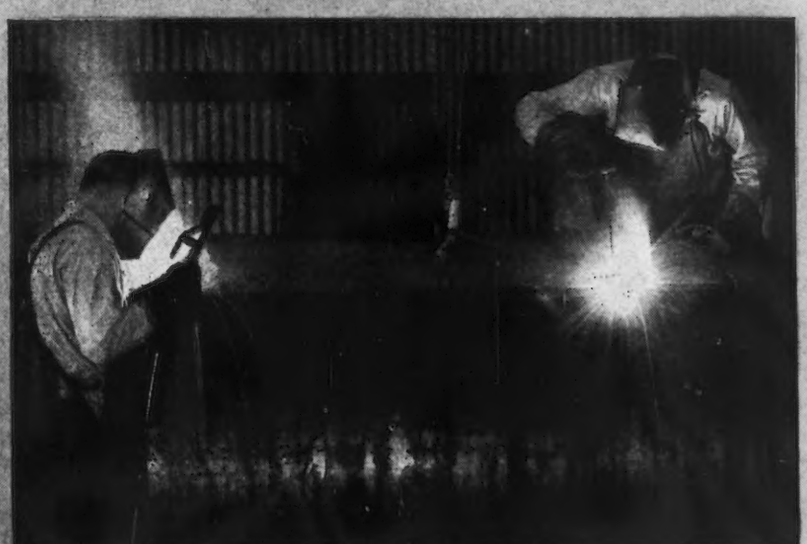
The first session of the Preparatory Committee gave all the indications that it might be a session of the Electoral College belatedly deciding who will be the President. Following the welcoming speech, the temporary chairman called for nominations for the permanent chairmanship, whereupon the U. K. delegate, H. A. Marquand, was on his feet immediately to propose the name of M. Suetens, Belgian delegation chief. He made his nomination speech from carefully prepared notes, and as soon as he yielded the floor Clair Wilcox, head of the American delegation, who was seat-

Food Machinery · Pacific Supply

Both Use SMITHway *Certified* Electrodes

Welding stainless steel reel cops on a Food Machinery pressure cooker

Food Machinery Corporation, Anderson Barngrover Division, San Jose, Calif., manufactures continuous pressure cookers and coolers used widely by the food-processing industry in canning fruits, vegetables, evaporated milk, meat and fish products. An exclusive user of SMITHway Stainless Electrodes (SW-159), they know that their proof is in plant production—*and in service.*



A Pacific "Groundplane" bucket being welded with SMITHway Electrodes

Pacific Supply Company, South Gate, Calif., uses SMITHway Electrodes (SW-11, 15, and 35) in the manufacture of its scientific land-leveling "Groundplane." They know from experience that the continuous welding research of the A. O. Smith Corporation is built into SMITHway *Certified* Welding Electrodes, making them a better production tool —for *all* kinds of jobs in *all* kinds of plants.

SMITHway *Certified* Welding Electrodes—Made *by* Welders . . . *for* Welders

Through Leading Distributors Everywhere

SMITHway A. C. WELDERS

Six models, including 3 new models of 150-, 200-, and 250-ampere capacity. Heavy-duty models: 300-, 400-, 500-ampere capacity. Write for specifications and prices.

A. O. SMITH Corporation

NEW YORK 17 • PHILADELPHIA 5 • PITTSBURGH 19 • CLEVELAND 4 • ATLANTA 3
CHICAGO 4 • TULSA 3 • MIDLAND 5 • DALLAS 1 • HOUSTON 2 • NEW ORLEANS 18
SEATTLE 1 • SAN FRANCISCO 4 • LOS ANGELES 14
INTERNATIONAL DIVISION: MILWAUKEE 1

ed at the elbow of the British delegate, rose to second the nomination, reading from a page of slickly composed diplomatic prose.

After a 30-sec pause for additional nominations, marked with only a sterile silence, the temporary chairman declared Mr. Suetens elected, and after a polite round of applause Mr. Suetens picked up his papers, already conveniently packed in a brief case, carried them to the chair at the top of the horseshoe, pulled out of the brief case a gracious speech of acceptance and the conference was under way.

AFTER the head of the Czech delegation had been named vice-chairman and the Cuban chief second vice-chairman, the provisional agenda as outlined by the Economic and Social Council of the United Nations in February was approved, following the statement of certain reservations on behalf of the American delegation and the Australian representatives.

When the day's business reached that point on the program which called for a "general discussion of the scope of the work of the Preparatory Committee," the British delegate was immediately back on his feet with the proposal that the committee adjourn and then immediately open an executive session to discuss the scope of the work it is to do. Following a decent lapse of 5 or 10 sec, the new chairman accepted this as the sense of the group and declared the plenary session, with the attendance of the press, adjourned.

The main body of the work to be accomplished as outlined in the provisional agenda will be the establishment of committees covering the following subjects: Employment and economic activity; restrictions, regulations and discriminations; restrictive business practices; intergovernmental commodity arrangements; and administration and organization.

The first first four will presumably hold committee meetings and bring forth specific proposals in their particular lines which may be considered at later plenary sessions. The Preparatory Committee will also make a proposal on the date and place of the International Conference next year, as well as recommending what states if any who are not members of the United Nations should be invited to the conference on trade and employment.

Discusses Plans For Creation of Italian-U.S. Financial Firm

Milan

• • • **The creation of** a big Italo-American financial concern is being discussed in Rome, the capital of which would be subscribed by the Italian and American iron and steel industries. The Italian Government would transfer to the new concern the control of the Finsider (government steelholding company) including the Ilva iron and steel works, and the Brescia iron and steelworks. American iron and steel manufacturers would under the terms of the proposal insure to the Italian industry a supply of raw materials and semi-finished material at special terms granting deferred payment.

At the same time the Italian iron and steel industry has received proposals for a Swedish participation to the financing of the reconstruction of the Italian works, and representatives of the Uddeholm and Avesta Steelworks have recently been in Milan. They have met the representatives of the Fiat, Dalmine and Finsider organizations to study the possibility of an agreement to exploit the factories in the Italian peninsula as a basis for the expansion of the Swedish iron and steel industry on Mediterranean markets.

As a whole the present output of the Italian iron and steel industry is about 50 pct of the prewar one, and according to the point of view of Italian technical experts one way to reestablish the prewar output would be the reconstruction of the Ilva iron and steel works at Porto Ferraio (Elba Island). Such reconstruction involves the expenditure of several billions of lire, the reason why the Italian iron and steel industrialists are following with the keenest interest the foreign proposals.

In view of the increasing number of orders secured from foreign countries by the Italian automobile industry and by the Italian shipbuilding industry (five vessels have been ordered by Argentina) the demand for iron and steel products is increasing, and therefore the prospects of the Italian iron and steel industry are improving. In this regard it should be noted that Italian shipbuilding industrialists are insisting upon the Italian Government granting a premium on every ton of Italian metal material used in Italian-built ships.

T'WAS EVER THUS: *Danger signs, large and well marked, warn human beings to stay away from these unexploded rockets, shells and grenades which are piled in 14 sq miles of heathland in Britain. But holiday-makers park close to the signs and walk in and around the forbidden area.*

Coal Compromise Made By France and Belgium

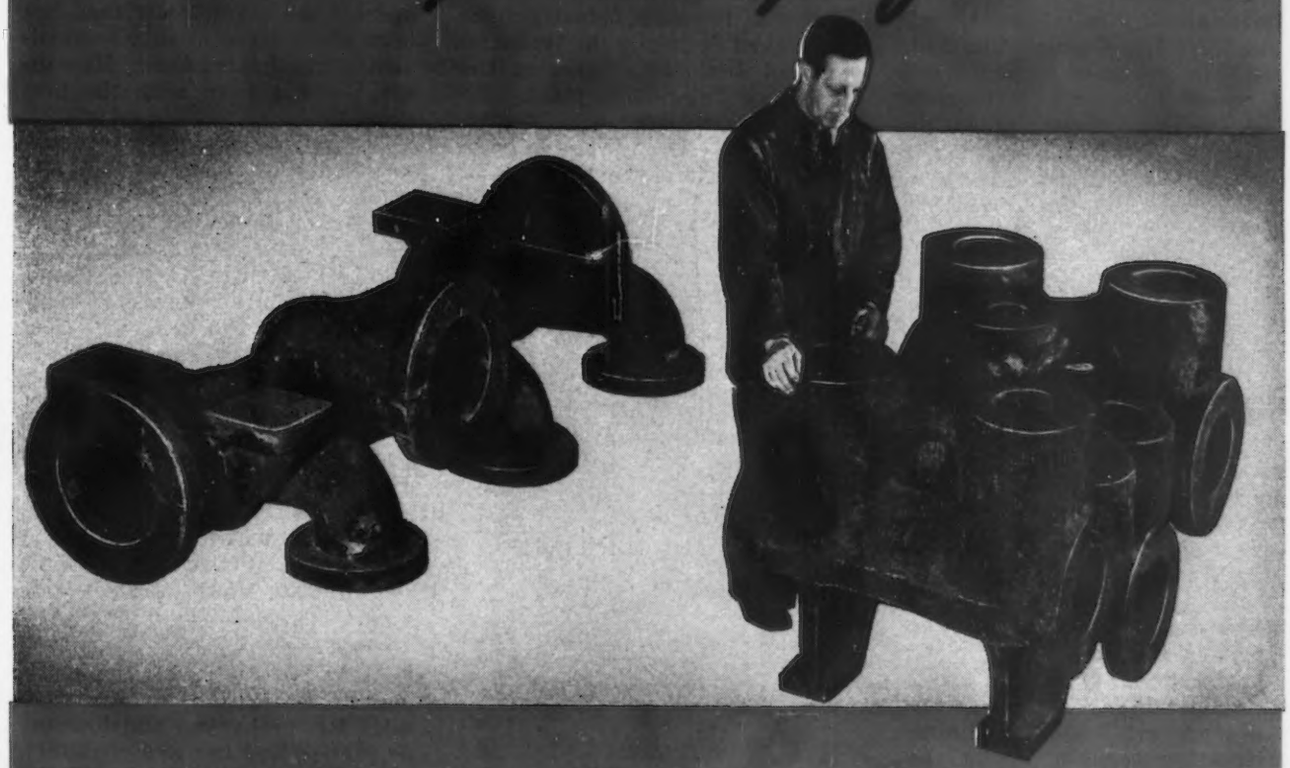
Paris

• • • **France and Belgium** have reached an agreement, taking effect from Nov. 1, whereby Belgium will manufacture coke for France from 82,500 tons of American coal purchased by France from the U. S.

It is estimated that 60,500 tons of metallurgical coke will thereby become available for French iron and steel works, and that pig iron production could be raised by 17 pct. Belgium will take advantage of the coke gas produced which is estimated at 20 million cu m.

Strikes have occurred in metallurgical works in Belgium, but an agreement has now been reached to increase wages to 13.20 francs (30¢) an hr although the strikers asked for 13.50 francs.

PRESSURE CASTINGS
are a Specialty of ours



These are for the OIL INDUSTRY

The strong and dependable steel castings that high pressure service requires—that's the kind of castings PSF is both well equipped and thoroughly accustomed to produce. You'll find plenty of evidence of that fact in PSF-built equipment now in service all through the oil refining, chemical and process industries, and the pump and turbine fields. But here's the essential point—ability and experience on the tough jobs is your best bet on any steel casting work, no matter what type of service is involved. • In other words, whatever the job is, put it up to PSF *first!*

Check us on
CONTRACT MANUFACTURING TO YOUR "SPECS"

Along with pressure castings, another specialty of ours is 100% finished and assembled work—sub-units or entire machines. Let us figure on your jobs, from the castings up.

PITTSBURGH STEEL FOUNDRY CORP.
Glassport, Pa.

Plants:
Glassport, Pa. and McKeesport, Pa.

Sales Offices:
New York · Chicago
Philadelphia · Washington

45 YEARS OF STEEL CASTING KNOWLEDGE

PERSONALS

o o o

• **Homer L. Hosking,** formerly vice-president of the U. S. Radiator Corp. and its Pacific Steel Boiler Div., has been elected president of the newly-formed Republic Boiler Corp., with headquarters in New York. **Willard Scott** is secretary.

• **Gene Henry,** formerly with American Central Mfg. Corp.'s sales division, Connersville, Ind., has been promoted to supervisor of production control. **Kenneth Cook,** training instructor in the company's American kitchens school, has been named assistant sales manager of the product division. Mr. Cook also will continue to handle sales training. New distribution manager of the product division is **Larry Coen,** formerly assistant sales manager of the division.

• **Arlington W. Clark** has been appointed general manager of Snap-On Tools of Canada, Ltd., and will have charge of coordinating sales, production and distribution at the firm's home office in Long Branch, Ontario.

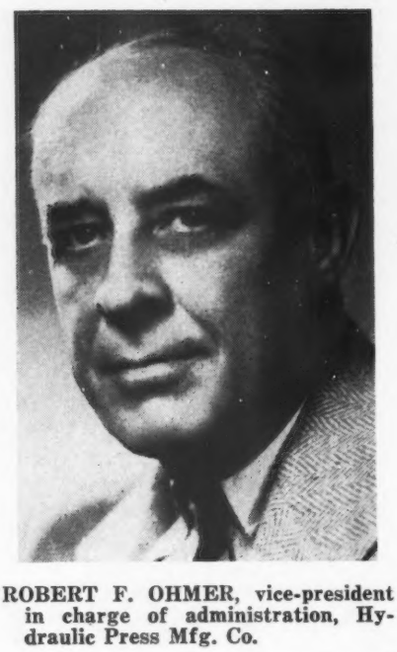
• **Leighton M. Harvey** has been appointed sales engineer for the metal products division of Ryan Aeronautical Co., San Diego. He will represent Ryan in a liaison engineering capacity in its contacts with aircraft and engine companies throughout the East. Mr. Harvey will make his headquarters at the company's eastern office in Washington.

• **Herman Everhardus** has been appointed assistant to D. C. Rulo, industrial relations director, of the Nash-Kelvinator Corp., Detroit.

• **C. O. Thomas,** president of the Shaler Co. and the National Rivet & Mfg. Co., both of Waupun, Wis., will retire Nov. 15, after having been head of both firms for 4 yr. At a later date he will take an active part in the management of the Pal-O-Pak Insulation Co., Hartland, Wis., of which he is president.

• **D. J. Hasinger** has been appointed general manager of Portable Products Corp.'s Paul & Beekman Div. at Philadelphia. He comes to Paul & Beekman from the McCreary Tire & Rubber Co., Indiana, Pa.

• **Bruce Bevelheimer** has been named assistant to the vice-president of Furnace Engineers, Inc., Pittsburgh. He has been associated with the steel industry since 1924 when he joined the technical staff of Bethlehem Steel at the Sparrows Point, Md. plant. He has been associated with the Algoma Steel Corp., Sault Sainte Marie, Ontario, since 1944.



ROBERT F. OHMER, vice-president in charge of administration, Hydraulic Press Mfg. Co.

• **Robert F. Ohmer** has been appointed vice-president in charge of administration of the Hydraulic Press Mfg. Co., Mount Gilead, Ohio. Prior to being called to active service in the Army in 1942, Mr. Ohmer was president of Commonwealth Engineering Co. of Ohio.

• **Don T. Allen,** executive administrator of the A. O. Smith Corp.'s Chicago district, has resigned to become assistant general manager of the Great Lakes Steel Corp., Detroit.

• **Philip Roden,** production manager for the Blatz Brewing Co., Milwaukee, has been appointed general manager of the Michael Yundt Co., Waukesha, Wis.

• **William F. Langefeld** has been appointed purchasing agent of the Austin-Western Co., Aurora, Ill.

• **George S. Warren,** formerly with Ingersoll Steel Div. of Borg-Warner Corp., New Castle, Ind., has been appointed vice-president in charge of engineering of the Arms-Franklin Corp. of Youngstown, Ohio, and also the Taylor-Wilson Mfg. Co. of Pittsburgh.

• **Carroll E. Lewis,** former manager of the controls division, has been elected executive vice-president of the Perfex Corp., Milwaukee. He has been with the firm since 1944.

• **Quentin Graham** has been appointed manager of the Ridgway, Pa. Div. of the Elliott Co. For the past 2 yr, Mr. Graham has been manager of the Elliott electrical engineering department. He replaces **H. S. Pahren,** who has moved to New York as Elliott district manager.

• **Russell P. Proffitt,** since 1933 Chicago divisional manager of the Timken Roller Bearing Co., has been transferred to the Washington office as district manager. Mr. Proffitt began his career with Timken in 1923 in the Huntington, W. Va. office.

• **Alvin F. Groll** has been placed in charge of the E. W. Bliss Co.'s sales for mechanical and hydraulic presses and can and container making machinery in the Cleveland area. Mr. Groll had been associated with Bliss for 12 yr as a design engineer and sales engineer. During the past year he was design and sales engineer for Mueller Engineering Co.

• **Harry W. Bearfoot** has been appointed a representative of Kennametal Inc., working out of the Philadelphia office.

• **Paul Hacker** has been named operating manager of Pioneer Engineering & Mfg. Co., Detroit. He will direct all activities of the Pioneer staff of engineers, designers, processors, and draftsmen. Mr. Hacker's background in mechanical engineering includes 27 yr with Packard Motor Co. and 4 yr with Pioneer Pump & Mfg. Co At Packard, during the past 4 yr, he was sales manager and finally operating manager of Pioneer pumps. **Ted Campbell,** for 17 yr with F. Joseph Lamb Co., has been added to the Pioneer staff as chief die engineer.

M. R. BLATTNER, head of the business management department, Lincoln-Mercury Div., Ford Motor Co.

• **M. R. Blattner** will head the business management department of the Lincoln-Mercury Div. of Ford Motor Co., Dearborn, Mich. From 1928 through 1941 Mr. Blattner was employed by Chevrolet as a field accountant. He comes to Lincoln-Mercury from Reynolds & Reynolds Co., Dayton, where he was manager of the dealer accounting standards systems division.

• **George A. Jacoby** has been named director of the service activities section of the personnel department of General Motors Corp., Detroit, succeeding the late O. L. Beardsley. Mr. Jacoby was formerly assistant personnel director of Buick Motor Div.

• **L. G. Tingwall, Sr.** has joined the organization of Intercontinental Engineers, Inc., Chicago, in the capacity of engineering consultant. Mr. Tingwall until recently was a member of the general office engineering staff of Revere Copper & Brass, Inc., of New York.

• **D. B. Gooch** has been appointed sales representative in all of North and South Carolina and parts of Alabama and Georgia, for Pittsburgh Lectrodryer Corp., Pittsburgh. Mr. Gooch has been associated with Gulf Refining Co., J. P. Devine Mfg. Co., Inc., the Blaw-Knox Co., and the Cornell Machine Co., in various executive capacities.

• **Oscar G. Knapp,** vice-president and treasurer of Clark Bros. Bolt Co., Milldale, Conn., has been named president and treasurer to succeed the late **Edwin S. Todd.**

• **John S. Coleman** has been named president of Burroughs Adding Machine Co., Detroit, succeeding **Alfred J. Doughty,** resigned. Mr. Coleman joined the company in 1920 as junior salesman in the Washington branch. Other executive promotions are: **Laurence V. Britt,** former executive vice-president, to chairman of the board and chairman of a newly formed executive committee; **J. L. Stewart,** former vice-president, to executive vice-president. **Thomas G. Long,** legal counsel for the company, has been named a director. **Raymond G. Bower,** director and factory manager, has been promoted to vice-president in charge of engineering; and **Ray R. Eppert,** from sales manager, to vice-president in charge of marketing.

• **Fred C. Ziesenheim** has been appointed sales manager of the plastics and die casting machinery divisions of the Hydraulic Press Mfg. Co., Mount Gilead, Ohio.

• **Louis V. Sutton, Jr.** has been appointed methods engineer of Edwards Co., Sanford, N. C., an affiliate of R. B. Rogers Cos., Inc., New York. Mr. Sutton was recently released from the Navy.

• **Robert Henniger** has been appointed special representative for Calco Machinery Co., Philadelphia. He has been associated with the Carlton Machine Tool Co. for the last 12 yr, and resigned his position as superintendent to join the Calco organization.

• **R. A. Schroeder** has been appointed head of the planning section, operations division of Willys-Overland Motors, Inc., Toledo. Mr. Schroeder formerly was assistant director of the planning staff for General Motors Overseas operations. He served with General Motors Overseas for 10 yr in various capacities, including the sales, purchasing and engineering operations.

D. S. HARDER, vice-president in charge of operations, Ford Motor Co., effective Dec. 1.

• **D. S. Harder,** president of E. W. Bliss Co., Brooklyn, since 1945, has resigned to become vice-president in charge of operations of the Ford Motor Co. on Dec. 1, but will remain as chairman of the board of Bliss.

• **Bruce K. Steele** has been named director of regions for Plymouth Div. of Chrysler Corp., Detroit. He first joined Plymouth in 1933.

• **Helmer Peterson** has been appointed factory manager of Mack-International Motor Truck Corp.'s Long Island City, N. Y. plant. In his new capacity Mr. Peterson will oversee the manufacture of Mack fire apparatus, as well as the fabrication of replacement parts for obsolete models of the entire Mack line. Employed by Mack since 1942, his headquarters have heretofore been located at that company's Plainfield, N. J. plant.

• **S. A. Newman,** recently released from service in the Navy, has been appointed chief turbine lubrication engineer by Gulf Oil Corp., Pittsburgh. He will direct lubrication engineering activities in connection with all forms of turbines in the 30 states comprising Gulf's marketing area. Mr. Newman joined Gulf in 1930, and advanced to assistant division manager in charge of industrial lubricating sales for the Pittsburgh division.

• **Jack Kollman,** a veteran of 25 yr service with the Ekco Products Co., has been appointed to the post of general superintendent of the Chicago manufacturing plant. He formerly was technical engineer in the company's bakery division and previously was in charge of construction and plant expansion.

• **Robert C. Singleton** has been appointed technical adviser to Nelson Sales Corp. Mr. Singleton had been associated with Joshua Hendy Iron Works as metallurgist, leaving this post to become senior metallurgical engineer for Nelson Specialty Welding Equipment Corp. at San Leandro, Calif. As technical adviser to Nelson Sales Corp., Mr. Singleton will make his headquarters with the latter firm at Lorain, Ohio.

• **Elmer A. Mulson,** for the past 10 yr sales engineer with the Barney Machinery Co., has been named manager of the Pittsburgh district office of the Baldwin Locomotive Works.

• **Nelson H. Stewart,** superintendent of the Westinghouse Electric Corp.'s electronic tube plant at Fairmont, W. Va., since 1942, has been named resident representative at Bloomfield, N. J., of the company's foreign licensees in electronics. **Hans N. Horst** has been appointed assistant superintendent in charge of sunlamp and heat lamp manufacturing at Fairmont. Mr. Horst joined the company in 1929 at Bloomfield, and since 1943 has been staff supervisor in the large incandescent lamp manufacturing department.

SAM A. HIGGINBOTTOM, vice-president, Pratt Industries, Inc.

• **Sam A. Higginbottom** has been appointed vice-president of Pratt Industries, Inc., Frankfort, N. Y. He will also continue as sales manager. Mr. Higginbottom became affiliated with Pratt in 1944 following 2 yr as a district manager for the Smaller War Plants Corp.

• **John V. Tinen,** professor of accounting, Northwestern University, has been elected executive vice-president of the Hafner Mfg. Co., Chicago.

• **Oscar L. Bowden** has been appointed production superintendent of the Standard Transformer Co., Warren, Ohio. He was formerly with Ohio Public Service Co. at Lorain and had served 15 yr with the Cities Service Co.

• **William C. MacDonald** has been named director of sales of the plumbingware division of Briggs Mfg. Co., Detroit. **Lee Hopper** has been named as his assistant.

• **Jerome R. Steen** has been appointed director of quality control for the lamp, fixture, wire products, tungsten and chemicals, radio tube and electronic divisions of Sylvania Electric Products Inc., Ipswich, Mass. He joined the staff of Sylvania Electric in 1931 as supervisor in charge of finished tube quality control at the radio tube division's plant at Emporium, Pa. In 1936 his work was expanded to include similar activities at the Salem, Mass. radio tube plant. He was transferred to the commercial engineering department in 1942 and appointed manager of the quality control engineering department, radio tube division, in 1944.

• **John A. Buckley,** formerly of the General Electric Co.'s lamp department of Nela Park, Cleveland, has been appointed merchandise sales manager for the GE chemical department. Mr. Buckley, who will be responsible for the sale of consumer goods items, will make his headquarters at Pittsfield, Mass. **Charles H. Warner** has been named district auditor of the General Electric Co. in San Francisco, succeeding James W. Mahoney, who has been with GE in San Francisco for 40 yr. **Arthur D. Bragg** has been named assistant district manager of the General Electric Co.'s apparatus department and will retain his responsibilities as manager of the central station division.

...OBITUARY...

• **Calvin H. Taylor,** assistant to the president of the Strong Steel Foundry Co., Buffalo, died suddenly Oct. 14.

• **William M. Kelly,** 47, chief draftsman for Southern Steel Works Co., Birmingham, died Oct. 17.

• **Ernest H. Koenig,** who was an associate engineer with Freyn Engineering Co. for more than a decade, died in Chicago on Oct. 10. Previously he had been connected with the Republic Steel Corp., Colorado Fuel & Iron Corp., and Perin & Marshall.

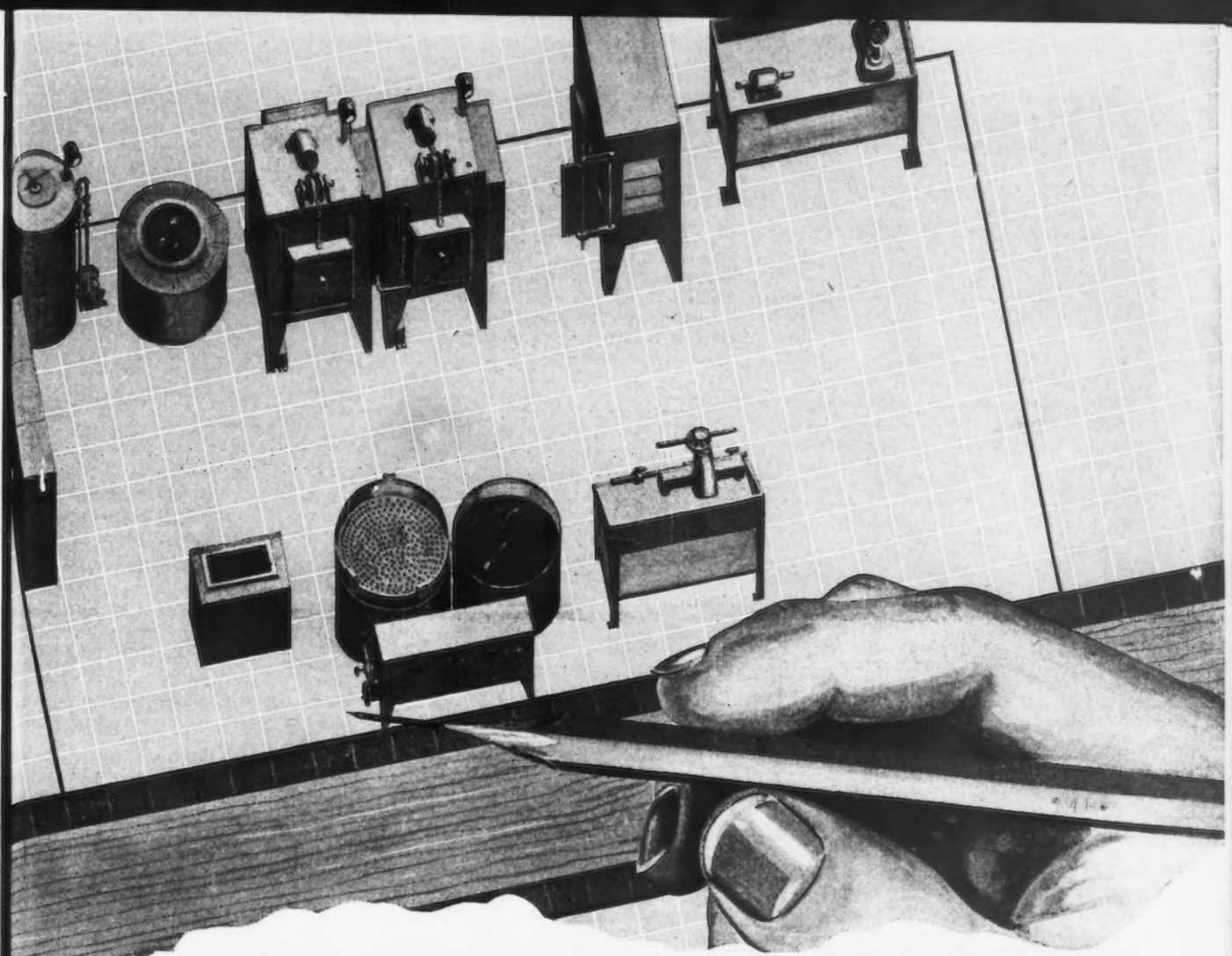
• **Howard W. McAteer,** 75, president of the American Steel Export Co., Inc., New York, died recently.

• **Edward Flynn,** 72, safety engineer for Reynolds Metals Co. at Listerhill, Ala., died Oct. 14.

• **Walter S. Wilkins,** governing director of Wilkins & Mitchell, Ltd., Darlaston, England, died Sept. 30.

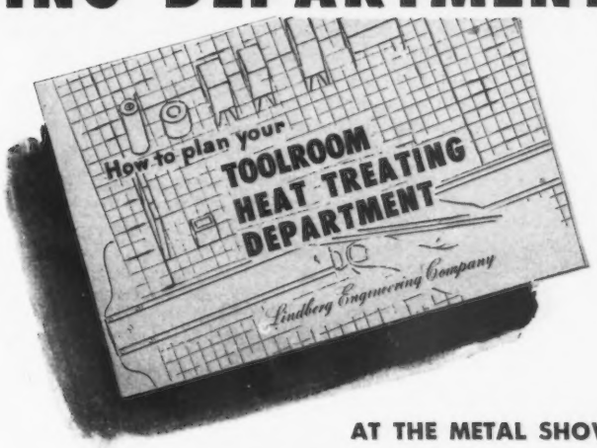
• **Thomas E. Banning,** 62, who had been traffic manager for the Columbia Steel Co. in San Francisco since 1923, died Oct. 6 after a brief illness.

• **Adolph J. Boehme,** 69, died Oct. 21, a few weeks after he retired from the Youngstown Sheet & Tube Co., Youngstown, Ohio. From 1923 until his retirement Mr. Boehme was land and tax agent for Youngstown Sheet & Tube. He joined the company as chief field engineer 39 yr ago and was in charge of much of its expansion work.



HOW TO PLAN YOUR TOOLROOM HEAT TREATING DEPARTMENT

NOW—a practical and helpful discussion to assist you in planning your toolroom heat treating department—complete with diagrams, floor space layouts, approximate cost figures, etc. Material in this booklet is based on information gained from helping in the design of hundreds of toolrooms—plus additional information gathered from the experiences of our associate, Lindberg Steel Treating Company, who operate one of the world's largest toolroom heat treating set-ups.



IT TELLS . . .

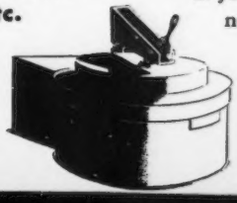
- ★ **How to lay out your department.**
- ★ **How much floor space is needed.**
- ★ **How to select equipment of the proper size.**
- ★ **What auxiliary equipment is required.**
- ★ **What toolroom will cost with all accessories—grinder, hardness tester, etc.**

AT THE METAL SHOW

(Nov. 18-22, 1946, Atlantic City, New Jersey)

Visit the Lindberg booth D-139, and see first hand a complete toolroom heat treating department, (—one of five covered in this booklet). It's complete in every detail from atmosphere generator to heat treater's tongs. Also arrange for your copy of "How To Plan Your Toolroom Heat Treating Department."

If you are unable to attend the show, write Lindberg Engineering Co., 2452 West Hubbard, Chicago 12, Illinois.

LINDBERG  **FURNACES**

Dear Editor:

LIVE LONGER

Sir:

If available I will greatly appreciate two copies of Mr. Van Deventer's editorial, "Live Longer and Know Less," in the Sept. 26 issue. I wish to forward one copy to my son who is taking a business administration course at Kent State University, recommending that he read it at least once a week . . . I feel sure he will find this fine contribution which fits so well the overall situation from all angles, of great assistance now and greater as he matures . . .

C. V. JOHANSEN
U. S. Steel Export Co.
New York

TEL-AVIV LIBRARY

Sir:

We feel we must write to tell you of the great interest shown by visitors to our library in THE IRON AGE, which maintains the high standard for which American journals are renowned the world over . . . We are sure that your valuable publication is serving to increase the interest of our trading community in the United States, its industry and trade.

I. KATZ
Secretary
Chamber of Commerce
Tel-Aviv & Jaffa
Palestine

SOIL PIPE PRICE PUZZLE

Sir:

Would you kindly advise us the correct price we are to charge for 4-in. extra heavy, single and double hub soil pipe, to jobbers, plumbers and builders? Can you also advise us with information regarding HH orders, as for example: Who must supply us with HH ratings; what percentage of our production can be sold with HH ratings; and what percentage of our production can be sold without HH ratings?

R. WEISBERG
President
Lafayette Foundry Products Co.
Philadelphia 33

● Our Washington experts tell us that the base price for 4-in. extra heavy soil pipe is 80¢ per ft for single hub and 86¢ for double hub. Jobbers, plumbers and builders get a 33¼ pct discount from those prices, and since the base is f.o.b. Birmingham, regulations provide for a reduction of the base by ¼ pct for every 25¢ carload rate from Birmingham. Jobbers buying carload lots receive an additional 10, 10 and 5 pct discount; plumbers and builders get 10 and 10 for carloads. Jobbers buying l. c. l. get 10 and 5, while no additional discounts are available to plumbers and builders buying l. c. l. With respect to the HH ratings, 7 pct of your cast iron soil pipe production can be sold without HH ratings, while the balance, 93 pct, must be sold on HH ratings. The ratings should be obtained from the customers of the jobbers, plumbers and builders whom you supply. Additional information on CPA and NHA regulations covering the subject was given on p. 102 of the Sept. 5 issue.—Ed.

WHERE IS THE STEEL?

Sir:

We read with great interest the item "Where Is the Steel?" on p. 103 of your Oct. 17 issue. Since this question is asked us many times a day we would appreciate your permission to copy the item for occasional distribution to some of our customers . . .

C. K. MUNN
Assistant General Sales Manager
Edgcomb Steel Corp.
Hillside, N. J.

● Permission granted.—Ed.

TOOL STEEL DIRECTORY

Sir:

Will you please send me a copy of your "Directory of Tool Steel" which was written by T. W. Lippert. Enclosed is $1.00, the price of the directory.

J. F. STANDISH
Sales Engineer
Surface Combustion Corp.
Toledo 1

● The new and revised edition of THE IRON AGE "Directory of Tool Steels" is available to readers at the following prices: $1 for a single copy, $1.50 for two copies, $2 for three copies, and 50¢ each for five or more copies.—Ed.

CORRECTION

Sir:

With respect to the article, "Polarographic Analysis of Zinc in Aluminum Alloys," in the issue of Oct. 3, which was written by the undersigned, I would like to advise that reference 2 should be corrected to read: "R. H. Muller and J. F. Petras, J. Am. Chem. Soc. 60, 2990 (1938)."

F. R. DE PAOLA
Chief Chemist
Wilbur B. Driver Co.
Newark 4, N. J.

SPANISH PATENTS

Sir:

As a subscriber to your journal and a technical man, I have cataloged in my office much information on the important processes of your country's industry. Many of these processes are patented in your country, but as far as I can discover, many do not have patent protection in Spain. I would be interested in arranging patents in Spain for interested firms. I have a consulting engineering office and I am able not only to arrange for such documents but also to take charge of all associated transactions. If my post as professor of the highest technical engineering university in my country is not enough, I can give any guaranty desired.

R. ALTAMIRA
Madrid, Spain

● Professor Altamira's letterhead indicates an interest in electrical engineering.—Ed.

STRANGE ANALYSIS

Sir:

We have a steel which we have determined to be of the following analysis: C 0.93 pct, Mn 0.41, P 0.048, S 0.032, Si 1.07, Ni 1.95, Cr 14.96, W 0.19, Mo 0.22, Cu 0.82. Please advise if you know of any steel company which is now manufacturing this material, or its chemical equivalent.

W. C. PATTILLO
Chief Engineer
Southern Saw Service, Inc.
Atlanta

● That analysis conforms in no way to any standard steel type, not even exhaust valve grades in which occasionally appear some strange combinations. The high copper content and chromium and silicon contents you specify indicate perhaps the steels may belong to a series of stainless grades produced by Allegheny Ludlum Steel Corp., yet the high carbon and the nickel content rule out these grades also. Nor does the analysis fit any of the tool steel grades. Either the analysis is incorrect or if such a steel has been made, it was primarily on a special order for some particular purpose, which, together with the analysis, has not as yet become generally recognized.—Ed.

FIRST WITH DARRIN CAR

Sir:

I have just received the issue which contains a description of the Darrin car. I believe THE IRON AGE was the first news magazine to carry this story. It was through the efforts of your Los Angeles regional editor, Mr. Raymond Kay, that this story was made available so early to you. Mr. Kay's good nature, perseverance and patience made this story possible.

H. A. DARRIN
Darrin Motor Car Co.
Los Angeles

● Take a bow, Ray.—Ed.

STEEL TUBE INSTITUTE

Sir:

We have acquired from WAA an excellent plant building and have placed orders for tube mills, etc., and are expecting to be in production of electric metallic and commercial welded tubing shortly after the first of the year. We understand there is a very satisfactory association of manufacturers of welded steel tubing and would be pleased to have you advise us the name and address thereof.

GILBERT WOODILL
Executive Secretary
Andersen-Carlson Mfg. Co.
Los Angeles 1

● You probably have in mind the Formed Steel Tube Institute, 1621 Euclid Ave., Cleveland.—Ed.

45,000 Pounds WHEELABRATED in Three Hours

Nearly 100 tons of castings, an accumulation of several days pouring, awaited the newly installed 36" x 42" Wheelabrator Tumblast at the Neville Foundry Co., No. Kansas City, Missouri. In just three hours and 12 minutes operating time twenty four tons of this pile had been spotlessly cleaned by the Tumblast . . . an average of 1000 pounds Wheelabrated every four minutes.

Contrast this cleaning efficiency with their former methods: four large tumbling mills, requiring six men to load them in addition to the one man working exclusively on the mills, with the noise and dust inherent in this type of cleaning. Overtime labor was excessive since the cleaning room, of necessity, worked all day Saturday and Sunday to catch up with production.

Now, castings are cleaned the same day they are poured. And they are actually clean. Floor space formerly required for cleaning is utilized for more productive operations, cleaning costs have been drastically reduced and the efficiency of the whole foundry has been stepped up due to the installation of the Wheelabrator Tumblast.

Mr. Leslie Neville, owner of the Neville Foundry Co. had this to say about the Wheelabrator:

"I appreciate very much the cooperation and engineering assistance which you gave us. We are indeed greatly pleased with the operation and the results attained.

"Prior to the installation of the Wheelabrator, we operated four tumbling mills which required the service of one man during the entire day. Due to the noise and dust it was impossible for our grinding crew to work with any degree of satisfaction.

"On our first day's operation of the Wheelabrator we cleaned 48,000# of castings in 3 hours and 12 minutes of running time. There was no noise or dust with the operation and our castings came out looking as if they had been given a coat of aluminum paint. We feel that we are now in a position to give our customers a product which we will be proud of and at the same time at a considerable savings over previous cost. We are glad to recommend the Wheelabrator and want you to feel free to demonstrate this machine to any of your prospects."

Write today for further information on how you can increase your cleaning efficiency

American
FOUNDRY EQUIPMENT CO.

510 S. BYRKIT ST.
MISHAWAKA, IND.

WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT

Industrial News Summary...

- **Coal Strike Threat Still Present**
- **Steel Consumers May Act Panicky**
- **Brass Mill Output Hits New High**

THE temporary but politically slanted postponement of the coal crisis by no means removes the threat of a possible tieup at the mines later this year. This situation which has put a slight damper on the optimistic outlook for a continuation of the high steel ingot rate is expected to have immediate repercussions among steel consumers.

In recent weeks there had been a definite trend toward a more orderly steel market from the standpoint of the placement of orders and the production of steel. With steel consumers, however, highly vulnerable to any slight change in the steel market and extremely sensitive where the question of future supplies is concerned, it can be expected that many steel users will now resume their pressure tactics in an effort to speed up deliveries.

Because of the low supply of coal stocks and the precarious position of scrap supplies, a coal mine tieup later this year would have an almost immediate effect on the output of steel in some major plants. Furthermore, such a development would force down a number of blast furnaces some of which might be kept out of blast until the outcome of the steel negotiations in January had crystallized.

The absolute certainty that the steel union will demand a healthy increase because of the lower take-home pay compared with wartime levels and because of the sudden and sharp increase in living costs is also being given serious consideration by those wise consumers who in the past have attempted to anticipate interference with steel output and have accordingly used every effort to increase their inventories before actual conditions forced a showdown between the steel companies and the union.

ANY effort by large steel consumers to revert to their high pressure methods of attempting to expedite shipments and expand their orders will not meet with much success in steel company sales offices. The strong campaign put on by steel producers in the request that all consumers resurvey orders on the books covered by quotas will drastically shake up the delivery picture for 1947. Customers who have assumed that steel companies will deliver commitments due on all orders in addition to new ones will be disappointed if the steel companies find the total of such tonnage exceeds the customer's quota.

In revising open orders steel companies have given their customers a chance to change size and quality and bring their requirements into line with present production planning. The overall effect of this widespread practice is expected to help in leveling off steel demand so that it will be partly successful in eliminating the dangerous unbalance in inventories.

It was apparent last week that if the unbalanced inventory problem isn't corrected soon, customers who have been surmounting one obstacle after another in order to maintain manufacturing schedules will have to consider seriously canceling some deliveries and reducing their production rate to conform with the availability of all steel components.

The steel price situation was no closer to a settlement this week than it was some weeks ago. Negotiations are still going forward with OPA and the possibility that Congress may throw out price controls before the present controversy between the steel industry and the OPA is settled is by no means remote.

THE steel industry this week was rapidly finding itself placed in the identical position of a few years ago when it was attempting to obtain a price adjustment to cover past increased costs without reference to any subsequent wage raises which might be granted. The Government acted so slowly that before any price adjustments were made a substantial wage boost became a fact and the industry was forced to accept a price increase which was supposed to have covered increased costs before the wage raise and after.

Currently the steel industry is attempting to get specific price revisions on some products based on its claim of higher costs and lower return. It now appears that before this problem is definitely settled the industry will be in the midst of new wage demands and the entire cycle will again be repeated.

Steel operations this week are up ½ point to 90.5 pct from last week's revised rate of 90.0 pct of rated capacity. The revision in last week's figure was necessitated by a strike in a midwestern mill where 30,000 tons of steel were lost.

GOVERNMENT priorities for fourth quarter steel have so far been much lighter than at any time this year. If the Civilian Production Administration decides to grant fourth quarter priorities to freight car builders, such treatment plus whatever action may be taken on prefabricated housing directives will change the entire picture.

The freight car program alone would require about 98,000 tons of structurals, plates and sheets each month. However, an early estimate on the prefabricated housing program indicates that its full impact will not begin to be felt until early next year when some of the 150-odd prefabricators get into full production.

Brass mills throughout the country are now producing at a rate far greater than any previous peacetime period. Nevertheless, consumers of brass mill products are urgently in need of deliveries which were seriously curtailed during the period of the brass mill strike and the copper mine and refinery tieup. So far customers' demands have been so heavy, because of earlier interference with the flow of material, that there has been no recent indication of any order cancellation or postponement of deliveries.

• **NO AUTOMOTIVE PRESSURE**—Reports from Washington that the "Automobile Industry" is attempting to apply pressure behind a suggested investigation of the capacity of the steel industry are misleading. It is true that one automobile producer — but only one — has supplied a list of its projected steel requirements through 1970 to the Dept. of Commerce. So far other auto makers have not even been asked to supply such information and if asked to do so many are expected to decline, if for no other reason, because they feel unable to predict their steel requirements 23 yr in advance.

• **RAILROAD PURCHASING PLANS**—All railroads in areas of the country that encounter frozen road beds during the winter months must receive their new rails by the third quarter. Rails received later must of necessity be stocked and their installation postponed until spring. Because of strikes, 1946 rail deliveries were delayed with most roads ending the normal receiving time with about half of the tonnage they had ordered. Fourth quarter deliveries will be heavy but will come too late for use. The tonnage shipped the roads from now until Jan. 1, plus the carryover into 1947, will be subtracted from the 1947 rail program so as to decrease the amount that would normally be specified in 1947 purchases now being made. On cars, the roads continue to order in numbers that are limited to what can be financed. In the purchase of new diesel locomotives, their orders are not restricted as lending institutions are battling each other for the privilege of financing such equipment and have for months competitively cut interest charges in their attempt to land such issues. The apparent enigma of the difference in the willingness to finance new freight cars versus new diesel power by banking interests, stems somewhat from the past records of payment. Excessive delay in paying off loans on cars is rather widespread while payments for diesels are always promptly met.

• **LARGE-SCALE GEAR HOBBING**—De Laval Steam Turbine Co., Trenton, N. J., has ordered one of the largest gear hobbing machines ever built in this country. The unit will be able to handle worm gear sets up to 36-in., center to center. Two such machines are being built, one for De Laval, and the other for a shipbuilding and steel company. Gears of such magnitude are used extensively for screw-down sets in steel mills. The new hobber will be able to cut gears from aluminum bronze.

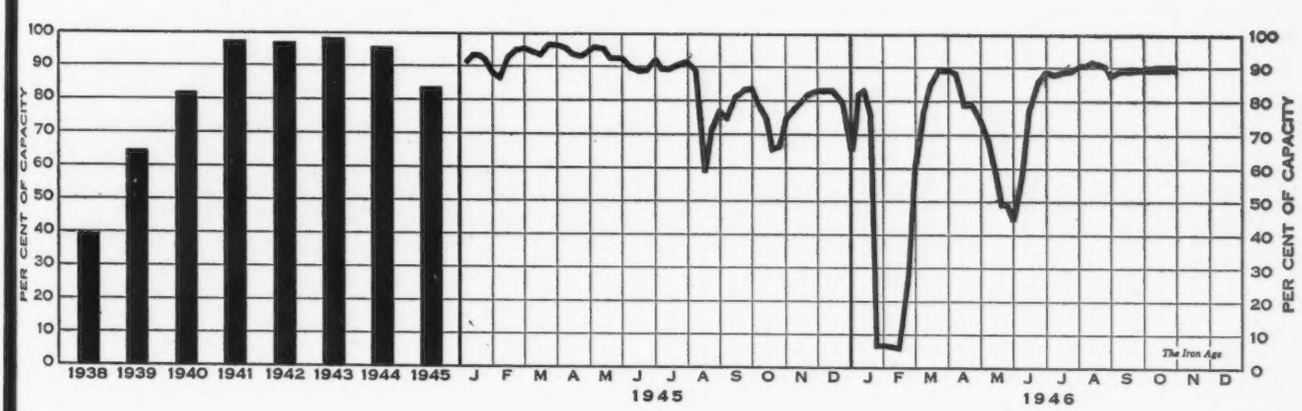
• **STEEL INQUIRIES**—Inquiries for steel have shown no falling off whatsoever, with steel companies rejecting huge tonnages each week. As a matter of fact inquiries could be two or three times as great as they are if mills were in a position to encourage them. Line pipe inquiries are phenomenal, with producers turning down hundreds of thousands of tons of inquiries every month. Obviously, many of the inquiries are duplicated but steel producers have been maintaining a policy of supplying their regular customers, so that where there is duplication of inquiries there is not much chance of orders being placed except from regular sources of supply.

• **ORDER BOOKS**—Backlogs, and their first cousins, carryovers, are still a major headache of steel producers. Carryovers (or broken delivery promises) have resulted in some mills refusing to open books on specific items for first quarter orders, while backlogs are running well into the second and third quarters of next year on certain products. As yet, there is no evidence of a curtailment of buying interest. Many consumers are becoming cautious in projecting their own production programs so as to be certain that their plans do not outstrip their abilities to obtain steel.

• **U. S. STEEL INCOME SOARS**—U. S. Steel reports a net income of $33,329,353 for the third quarter of 1946 compared with $11,624,420 in the third quarter of 1945. Earnings per share in the third quarter of this year were $3.11 compared with 61c for the same quarter of 1945. Finished steel shipments in the third quarter of this year were 4,457,557 net tons compared with 4,262,750 in the third quarter of 1945.

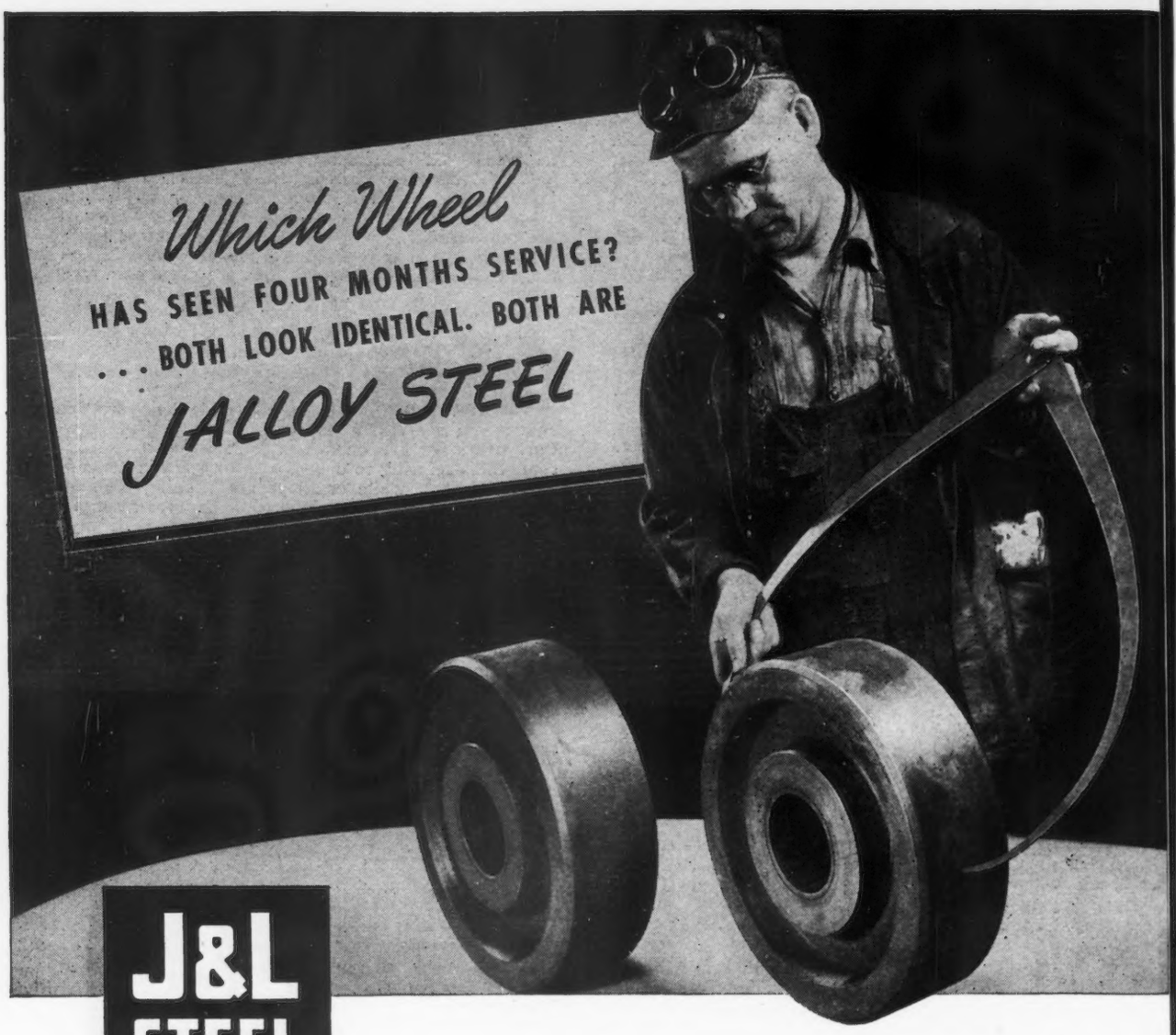
• **WIRE ROPE SUPPLY**—Wire rope has not been as short in supply as many other steel products. One reason being that, because of good prices, considerable amounts of hot-rolled rod have been channeled in that direction. With some 6000 tons of all sizes of rope presently being held in government surplus, which may soon be released at prices much below the present market, supplies may very soon equal the present demand and produce a more competitive situation among the manufacturers.

Steel Ingot Production by Districts and Per Cent of Capacity



Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
October 22.....	99.0	92.0	90.0	87.0	65.0*	102.0	96.0	97.0	101.0	76.0	99.0	74.0	86.0	90.0*
October 29.....	98.0	93.0	90.0	87.0	82.0	102.0	96.0	97.0	101.5	78.0	105.0	74.0	87.0	90.5

* Revised.



J&L STEEL

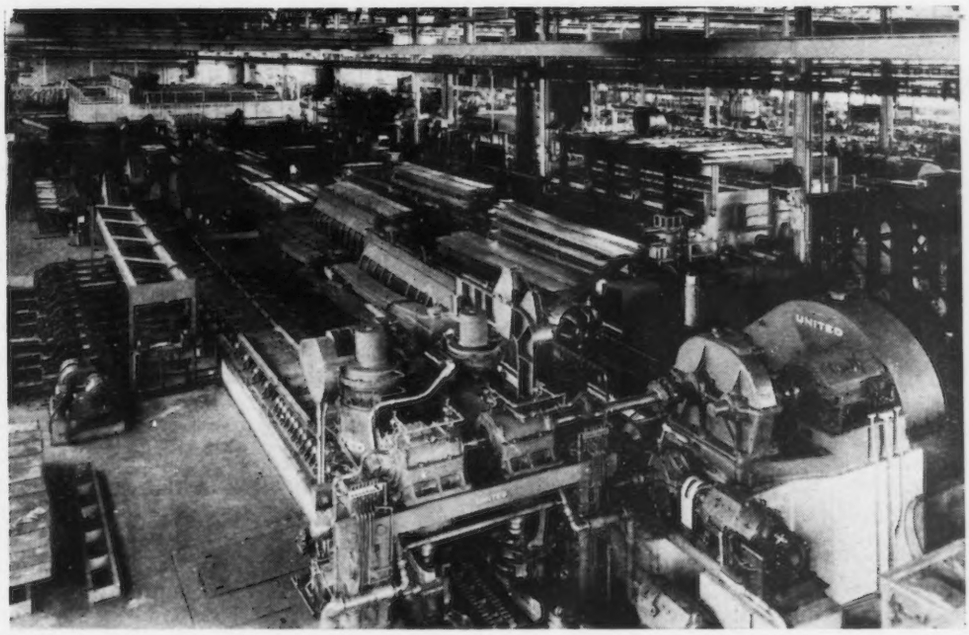
NEED MORE STEEL?

You can help by keeping your scrap moving back to the mills.

One of the two wheels above was in use for four months on a charging machine where it was daily subjected to repeated loadings of 300,000 pounds. Previously, regular carbon steel wheels would mushroom and have to be taken out of service in two weeks, thus presenting an expensive maintenance problem involving three men to make the replacement. A heat treated wheel of Jalloy steel was substituted and after four months' service removed for inspection. It is the wheel on the right. No appreciable wear can be seen when compared to the wheel beside it that was never in service. If you have an application that requires resistance to abrasion, fatigue and high impact strength write to us about heat treated Jalloy.

JONES & LAUGHLIN STEEL CORPORATION

PITTSBURGH 30, PENNSYLVANIA



BRASS HOT MILL: *The installation of hot-rolling equipment in the brass industry during the war made a significant contribution toward its increased capacity. August brass mill output was more than double the 1939 monthly average. This is a modern hot mill at Bridgeport Brass Co.*

Brass Mill Production Establishing New Peacetime Record

Waterbury

• • • **The brass mills** are producing now at a rate greater than any previous peacetime period. According to official figures of the industry, mill production during August was more than twice the average monthly production during 1939 and September is expected to equal or exceed this rate. August shipments of brass, nickel silver and phosphor bronze were more than 211 million lb, according to reports from the industry.

Nevertheless consumers of brass mill products are urgently in need of deliveries which had been seriously curtailed during the periods of the brass mill strike and the copper mine and refinery strikes. Therefore, mill products customers have not yet found it necessary to cancel any orders or postpone delivery as has been true of many other industries recently.

All brass mills except one are operating on a 3-shift basis but the second and third shifts are not fully staffed since the manpower is not available. Mills could expand their production still

By JOHN ANTHONY
Eastern Regional Editor

o o o

further with more men except that raw materials shortages would probably become more acute.

Mills are having little difficulty now in obtaining all the copper needed for their production. However, there has been a shortage in recent months of refinery shapes such as copper cakes, billets and wire bars due to the unwillingness of the refiners to sell shapes at ceiling premiums and thereby suffer a loss. Premium increases of $2.00 to $4.00 per ton have been granted effective Oct. 14 and the higher prices are expected to relieve this situation. Mills generally cast their own copper-zinc cakes. Some mills that are normally consumers of electrolytic copper have been forced to buy fire refined copper during the shortage.

Zinc is considered by the mills to be more critical than copper at this time. Prior to the 1.00¢ per lb price increase on zinc, most producers were unwilling to sell metal except on a few long-term commitments and were referring consumers to the Office of Metals Reserve for their requirements. MR stocks of High Grade stood at 142,000 tons at the end of September but consumers of Prime Western were having their requirements diverted to High Grade in recent months since stocks of the former were mostly tied up in plants on strike. This served to cut down zinc available to the mills.

The Office of Metals Reserve, it is understood, has been unwilling to purchase zinc on the world market while domestic production is sufficient to meet the country's requirements. Meanwhile, exports of zinc produced domestically from foreign ores are continuing at the world price which is 1.00¢ to 1.50¢ higher than the new domestic ceilings. Whether the zinc price increase will free additional supplies for the mills, it is still too early to determine.

Other raw materials which are even more critical to the industry at this time are lead and tin. Although both these metals are required in smaller tonnages than

copper and zinc, the former is essential for the production of free machining grades of brass and the latter for bronze compositions.

One mill executive has estimated that the additional cost of brass production due to the price increases on zinc and copper refinery shape premiums should approximate 0.25¢ to 0.30¢ per lb on an overall basis. There has been no evidence of action by the mills to petition for price increases based on these higher raw materials costs.

One principal reason for the current high rate of production for brass mill products is the industrywide adoption of hot rolling facilities during the war. The Bridgeport Brass Co. was the first to apply the principle of hot rolling to brass mill production in 1939. During the war other hot mills were established, some based on Bridgeport's specifications, at the government-built plants operated by American Brass at Kenosha, Wis., Chase Brass at Cleveland, Western Brass at East Alton, Ill., Revere Copper & Brass at Chicago and Bridgeport Brass at Indianapolis.

Some of the brass mills have expanded their facilities by purchasing or leasing the war-built plants they operated for the government. Chase Brass & Copper Co. bought the Cleveland Euclid Case plant for sheet brass production. American Brass Co. has bought the 4-high mills and other equipment which could be used at the Kenosha, Wis., plant and will distribute them among their existing plants. They have bids in for the two hot rolling mills and for the plant itself but as yet it has not been possible to obtain agreement on an adequate allowance for obsolescence and depreciation.

Revere Copper & Brass Co. has a bid in for a part of the Chicago plant although the sale of the entire plant had previously been authorized to Garrett Metals Corp. at a price of $3.5 million. However, the sale has not yet been consummated and it is understood that Ford, Bacon & Davis is completing a survey of the plant for the War Assets Administration. Bridgeport Brass Co. has taken a lease on the Indianapolis plant but it is understood that their bid for purchase has been exceeded by Garrett Metals Corp. by $1 million. No decision has yet been made as to disposition of either of these plants. Bridgeport Brass Co. bought its Navy plant at Bridgeport for use as a rod and wire mill.

With the tremendous brass rolling capacity of the modern hot mills it is the consensus of the industry that a few mills could provide all the rolled brass requirements of peacetime industry. The largest at Chicago has a monthly production capacity of 33 to 34 million lb of breakdown slabs or 20 million lb of finished sheet. The mills now are equipped for wartime brass sheet gages of the order of ¼ in. Conversion to peacetime light gages would in the case of one mill require an expenditure of several millions of dollars. Were many of these mills to be continued in operation, a copper shortage would create an immediate bottleneck and the industry's finishing equipment would be inadequate to handle the tonnage.

Production of brass products being as high as it is has encouraged some officials to predict that the time may not be far off when all customers' requirements can be shipped within the normal peacetime delivery periods. When this time will arrive is, of course, dependent on business conditions generally and estimates could not be offered. While there have not yet been any cancellations of orders for mill products, brass mill executives are cautiously watching the trend of many of their customers to develop and, in some cases recently, abandon grandiose plans for plant expansion. Since all but one mill are operating on a 3-shift basis it would be possible to curtail production in an orderly way without ruinous losses if confronted by an appreciable decline in demand.

The brass mills report that the

LONG AND LOW: *A 105mm high velocity gun with muzzle brake and an unusually low silhouette feature the army's newest super-heavy 100-ton tank shown here at Aberdeen Proving Grounds. The tank has double steel treads.*

productivity of their workers has improved significantly in recent months and consider that it is approaching the prewar normal. Most mills consider that the improvement is due to a better recognition of the need for higher peacetime productivity on the part of workers and the union leaders, re-education of the workers in the techniques of production for the civilian market and some direct negotiation between management and union leaders backed up by prewar and postwar statistics on productivity per manhour.

Officials observe that some probable causes of the lowered productivity of brass mill labor since the end of the war were a need for relaxation after years of wartime overwork and tension, the inability of even experienced personnel to reacquire the more delicate techniques of production required for the civilian market, and perhaps a measure of unwillingness to cooperate fully with management while wage negotiations were pending.

The brass mill industry generally is reorganizing its production and marketing program to meet the competitive market situation which should develop when production overtakes demand. Bridgeport Brass Co. has under way a large-scale plant modernization program in which each of its products fabricating divisions will operate independently with its own machinery and equipment. It is also expanding its products fabricating capacity with respect to mill capacity. Scovill Mfg. Co. is expanding its products field by entering the home attached gripper market.

All mills are engaged in reorienting their production facilities from wartime heavy gage mill production to the lighter gage, more highly specialized, peacetime requirements. In the meantime, brass mill products are being shipped to customers in tremendous volume.

Denmark Cycle Order

Prague

• • • **The ESKA** bicycle factory at Cheb in Czechoslovakia has accepted an order for 25,000 bicycles for Denmark, deliveries to commence immediately at the rate of 1000 per week.

Temporary Reparations Cut May Put Hungarian Steel on Export Market

New York

• • • **Because of some** temporary reduction in its reparation obligations, the Hungarian steel companies expect during this last quarter of the year to appear on the export market with such products as wire rod, plates and special sheets.

Iron and steel production in Hungary during the year gained about 100 pct, according to reliable reports reaching here. At present about three or four blast furnaces are in operation compared with a prewar total of six. These furnaces during the first half of the year produced 50,280 net tons of pig iron. During the entire 12 months of 1945, 44,083 tons of pig iron were smelted. For the first six months of 1946, raw steel output reached 144,379 tons compared with 147,171 tons for the entire previous year. A comparison of prewar, wartime and postwar output of iron and steel in net tons are given below.

	Pig Iron	Steel
1937	402,138	731,854
1942	459,561	862,945
1945	44,083	147,171
1946 first half	50,280	144,379

Since liberation of Hungary the steel industry has been working on a program of reconstruction, fulfillment of reparation orders and partially fulfilling the needs of devastated industry, transportation and agriculture.

Crippling of plants and machinery of the metalworking industry, ordered by the German occupation authorities during the retreat was not as effective as the Nazis had hoped because of the resistance of engineers and workers to a very large extent by the unexpectedly fast advance of the liberating army.

English Aircraft Firms Building 54,500 Houses

London

• • • **British aircraft** companies are swinging into production of aluminum prefabricated houses at a rate which promises to yield 54,500 by the Fall of 1947. Last December less than 30 a week were turned out, by June production had bettered the 200-mark and in September 404 were made.

It appears that these houses will cost more to make than their American counterparts, but less to erect. Factory cost is about $4000, while erection cost, including preparation of the site, will be approximately $1500.

Five British aircraft firms are building the houses which are entirely prefabricated, requiring only a foundation to be built on the site.

LESS NOISE, PLEASE: *Ryan Aeronautical Co. developed these stainless steel mufflers to reduce light plane engine noise. The company claims 90 pct reduction of exhaust noise with only 2 pct power loss with the 8-lb units displayed here by Betty Hughes, San Diego flyer.*

CHRISTMAS FOUR TIMES A YEAR: *Wendell Anderson, president of Bundy Tubing Co., Detroit is shown here presenting checks to employees at Bundy's Nine Mile plant. Nearly 200 employees who had worked full time for 3 months received checks for $118.27 as extra wages under Bundy's Cost Saving Sharing Plan. Under the terms of the plan the company paid out $213,228 during the 6 months period to 1291 men and women on hourly payrolls. Meanwhile, employee efficiency has risen 35 pct in the 6-months period.*

o o o

Bundy's Cost Saving Plan Adds To Employee Base Pay

o o o

By W. G. PATTON
Detroit Regional Editor

o o o

Detroit

• • • **Faced with the** prospect of closing its unprofitable fabrication department employing 75 pct of its employees, the Bundy Tubing Co. of Detroit, in cooperation with Local 369 UAW-CIO and a representative of the International Union, has worked out a "Cost Savings Sharing Plan" which has not only saved over 700 Bundy employees their jobs but, in addition, has resulted in the payment of extra compensation to each hourly wage earner who worked full time of $212.83 over a 6-months period.

Average hourly wage gain per employee over the base rate for the six months period is 20¢ per hr. There are no ceilings on employee earnings and some Bundy officials believe it would be possible to double the present extra payments to its wage earners.

Bundy employees had previously been granted an 18½¢ wage increase in conformity with the national wage pattern and their base rate without the extra pay resulting from the Cost Savings Sharing Plan is said by company officials to be comparable to the rates paid by other employers in the Detroit area for the same work.

Bundy Tubing Co. is a manufacturer of small patented tubing and markets its products chiefly in the automotive, refrigeration and gas range industries.

Production of tubing is largely machine controlled, but fabrication to customers' orders often requires special jigs, fixtures and know-how. The work is principally a job for hand labor and the fabrication department at Bundy had grown to a point where it employs 75 pct of the company's total personnel. At the time the decision was made to go out of the fabrication business (unless a satisfactory arrangement could be made with employees), production records showed that worker efficiency was only 55 pct of the standard for 1937 which was before piece work rates had been supplemented by hourly wages.

Since the adoption of the CSS plan six months ago, Bundy officials estimate that employee efficiency has risen 35 pct; absenteeism has dropped from 9 to 6 pct; scrap losses have decreased 7 pct under 1945 levels and time-out during the first three months for the negotiation of shop grievances was 900 hr less than was spent for the same purpose during the last three months of 1945.

Other benefits attributed to the plan by Bundy officials include decreased tardiness and general loitering, improved relations between the company and the union, self-policing of the plan and liberal introduction of new equipment and processes that result in lower production costs. Many of these changes have been recommended by the employees themselves, according to a spokesman for the company.

As described by company officials, the Bundy CSS plan is a plan whereby hourly employees can earn money over and above their regular base pay. The program was designed in such a way that all savings made in the cost of producing Bundy tubing are shared equally between the company and its hourly-rated employees.

Definitely not a piece-work plan, extra earnings of employees are in direct proportion to savings on production costs computed by determining the ratio of labor cost to the sales dollar; or the value of goods produced.

The base rate used in computing labor cost savings was arbitrarily selected as the 16-week operations period from Oct. 1, 1945, to Jan. 22, 1946. For this period, the company determined that 30¢ of each net sales dollar was paid out in hourly wages. Thus, for any month, 30 pct of the dollar sales becomes the allowance for hourly rated labor. The difference be-

tween this allowance and the amount actually paid for hourly labor makes up the gross earnings under the CSS plan.

For example, by comparing a month in which the company would pay out $210,000 in hourly wages and sell, for example, $840,000 worth of products with the previous month in which the same amount was paid out in wages and sales amounted to only $700,000, the company would have produced a theoretical $140,000 worth of additional goods.

Multiplying the sales figure of $840,000 by the 30 pct labor cost ratio gives $252,000. Subtracting actual wages paid of $210,000 leaves $42,000 which is divided equally between hourly-rated employees and the company. Each worker's share is determined by dividing $21,000 by the manhour total of 160,000. In such a hypothetical case this would mean an extra payment of 13.1¢ per hr for each hour worked during the month.

The CSS plan went into effect Apr. 1, 1946, and extra hourly earnings are paid quarterly. Actual extra hourly earnings for the month of April were 24¢; for May 18¢; and for June 22¢. During the second quarter, July extra hourly earnings were 13¢; August 22¢ and September 22¢. Results of the Cost Savings Plan are posted monthly on a large company bulletin board at the Bundy Nine Mile plant.

Total extra earnings shared by 1291 men and women employees for the six months period is $213,228.

Bundy officials deliberately avoid the use of the word "incentive" in describing their plan; neither is it, they say, a piece-work plan or a profit sharing plan. The union would have rejected, it is said, almost any suggested form of piece-work compensation and management was equally opposed to the usual type of profit sharing plan.

It is important to note that under the CSS plan employees participate on a basis of group productivity rather than on a basis of individual productivity which, according to Bundy officials, is already reflected in the base rate paid to individual workers. It will be observed that under this plan the janitor receives the same *extra* hourly compensation as any other hourly wage earner in the plant.

Other features of the plan are as follows:

Savings accumulated on a 3-month basis are distributed within 30 days after the expiration of each 3-month period.

Each 3-month period stands on its own merits.

Overtime and night shift premiums are paid.

The wage base includes wages paid for capitalized items, vacation allowances, hourly-rate wages paid to probationary employees, wages paid during inventory periods and special wage payments to returning veterans.

Net product sales are defined to include termination sales, disposal of equipment or other company property, sales of supplies or other items on which no work has been performed. Fluctuations of finished parts in the shipping room at the end of each period may be added or deducted as the case may be.

Foremen at the Bundy plant are on salary and do not participate in the CSS plan.

Certain basic factors such as percentage of tubing produced to tubing fabricated by the company are also taken into consideration. New employees participate in the plan only after a 30-day probationary period.

If sales prices are adjusted during a given period, the amount of the adjustment is not added to the net sales dollar.

Explaining the Bundy CSS plan, W. C. Ireland, vice-president and general manager, said, "The simplest explanation I can make of this plan is that it provides real rewards for an honest day's work by everyone concerned.

"It is no piece-work plan. It is no plan that pits one employee against another or one department against another. Neither is it based on any theoretical standards worked out with time studies nor somebody's ideas of what people should be required to turn out.

"The CSS Plan," he said, "pays off by collective effort—everybody doing a full job to the best of his efforts, can cut our production costs enormously. Cutting our production costs means savings on our labor costs. And we are willing to split these savings 50-50 with our wage-earning people."

A spokesman for the company has indicated that the union is also well pleased with the plan as it has worked out thus far. Frank Fagan, International UAW-CIO representative, is quoted as having registered satisfaction both with

Blast Furnace Capacity and Production—Net Tons

	Number of Companies	Annual Blast Furnace Capacity	PRODUCTION							
			PIG IRON		FERRO-MANGANESE AND SPIEGEL		TOTAL			
									Pct of Capacity	
			September	Year to Date	September	Year to Date	September	Year to Date	Sept.	Year to Date
DISTRIBUTION BY DISTRICTS:										
Eastern	12	12,988,970	871,410	5,887,489	22,565	163,758	893,975	6,051,227	83.8	62.3
Pittsburgh-Youngstown	16	25,939,940	1,846,715	12,318,500	25,249	120,407	1,871,964	12,438,907	87.9	64.1
Cleveland-Detroit	7	6,557,500	487,600	3,517,049	.....	.....	487,600	3,517,049	90.6	71.7
Chicago	7	14,093,510	988,974	6,863,136	.....	.....	988,974	6,863,136	85.3	65.1
Southern	9	4,924,770	320,688	2,288,898	13,662	79,522	334,350	2,368,420	82.7	64.3
Western	5	2,836,000	112,527	856,044	.....	.....	112,527	856,044	49.3	40.4
Total	37	67,340,590	4,625,914	31,731,096	61,476	363,687	4,687,390	32,094,783	84.8	63.7

Source: American Iron & Steel Institute

the CSS Plan and the negotiations that preceded its adoption.

"**It should be** said that all our meetings on the plan and the wage increase were carried out in a spirit of friendly cooperation. Everybody laid his cards on the table and we got along fine.

"As to the plan itself, it promises to be an answer to both company and employee problems. Bundy must have, and is entitled to, efficient and productive effort on the part of the workers.

"On the other hand," Fagan continued, "the CSS Plan gives every Bundy wage earner a real chance to raise his standard of living, to improve the welfare of his family and to provide security for the future. And these earnings are *not* based on *piece-work* or *standards.*"

Large numbers of employees have indicated their satisfaction with the working of the plan up to the present time.

Wendell W. Anderson, president of the company addressing Bundy employees on Dec. 17, 1945, made it clear that the board of directors had decided to go out of the fabrication business at the Nine Mile plant just as rapidly as possible. He explained the reasons behind the decision to quit the fabrication business. He told how losses suffered by the company in a strike had forced cancellation of postwar plans to add 27,000 sq ft of manufacturing space to existing facilities.

He proposed the introduction of an incentive system in the fabrication department and suggested that the system be worked out jointly between management and representatives of labor. Mr. Anderson set Dec. 27 as the deadline for an answer to his proposal.

On Dec. 28 a vote was taken by employees in the plant on the question, "Are you in favor of working on an incentive plan for the fabrication department by representatives of your own choosing and management?" Seventy-five pct of those present voted and 90 pct of those who voted, voted "Yes." No WLB supervision or permission was necessary to present the plan to the employees for a vote.

The plan finally adopted was originally proposed by management, the union representatives having failed to offer any specific plan before the expiration of the period agreed upon by the company and the union.

Bundy officials are quick to point out that during the 6-month trial period wages, prices and demand for the company's products have all been increasing. Similarly, the company has been able to increase the scope of its markets by introducing its double-walled tubing into many new industries including umbrellas, juvenile toys and furniture, metal furniture, garden implements, antennas for television sets, electric appliances and house heating.

"We do not know how the plan will fare," a spokesman for the company said, "if the reverse were true."

NHA Will Investigate Possibilities of Black Market Sales of Pipe

Washington

• • • **Diversion of steel** pipe supplies designed for the housing program, possibly to black market channels, was indicated at a meeting of the CPA Steel Pipe Industry Advisory Committee, Oct. 24. After CPA had been told by pipe producers that they had shipped about three times the veterans' housing and related utility requirements of buttweld pipe to distributors during the third quarter the agency implied that it would undertake a prompt review of steel pipe requirements for the housing program.

Committee members told CPA and NHA officials that they had channeled more than 300,000 tons of pipe to plumbing and heating distributors during July, August and September as compared with NHA estimated requirements of only 116,000 tons. On the basis of the above shipments, all of the housing needs should have been satisfied.

However, NHA officials said that pipe supplies are not adequate and pointed out that demands from builders have increased, because pipe which is at the tail end of house building, is urgently needed to complete NHA houses now under construction.

They further indicated that if investigations show that HH ratings had been disregarded by distributors, it might be necessary to impose an indefinite "set-aside" on all distributors' stocks of buttweld pipe.

NHA also said that a distorted geographical distribution pattern was also affecting pipe shipments. Industry members said that they were following the historical pattern of shipments of the 1937-40 period, but NHA spokesmen stated this pattern was not in line with present housing demands. The NHA representative said that construction demands were unusually high on the West Coast and in Texas which were low tonnage shipping points for the steel industry in prewar days, and emphasized that the steel industry must maintain shipments to all areas of the country to prevent a slowdown in the construction program.

Huge requirements of the utility companies for steel pipe to service new housing developments were set forth as an increasing supply problem in 1947. Government representatives said that many utility companies were reluctant to assure service extension to new housing developments because of the uncertain supply of steel pipe and other items. However, the 1947 production of buttweld pipe is expected to be about 1,800,000 tons, which would be adequate to cover all needs, CPA said.

Further complicating the pipe picture and adding to the demand is the unusual spurt in the installation of gas heating facilities.

Keep Those Records

Washington

• • • **OPA has announced that all producers, processors and other distributors of any commodity currently are required, effective Oct. 24, to retain for a year after date of decontrol all records and documents that they were required to keep or make.**

Hanna Co. Reports Profit

Cleveland

• • • **M. A. Hanna Co.** has reported net profit of $1,687,608 for the third quarter of 1946 after all charges including federal tax provision of $281,553. The profit is equal after preferred dividends to $1.54 a share on 1,030,464 common shares.

In the third quarter of 1945, net profit was $1,338,410, equal to $1.21 a common share, while tax provision amounted to $230,020.

Net profit for nine months of 1946 was $3,919,002, equal to $3.51 a common share, and compares with $3,337,463 or $2.97 a share, in the corresponding period of last year.

Weekly Gallup Polls . . .

Increasing Numbers Prefer GOP to Handle Strikes

Princeton, N. J.

• • • **Although the issue** of strike curbs and labor union regulation is being soft pedaled by both political parties for fear of losing labor votes, it continues to be one of the major issues in the minds of the American public, according to George Gallup, director, American Institute of Public Opinion.

There has been a complete turnabout in attitude on the question of which party can best deal with the problem.

A year ago the general feeling was that the Democratic Party could deal with unions better than the Republican Party. Today it is just the other way around. For every voter who still says the Democrats can deal best with the matter, two say the Republicans are the ones who can handle it best.

The change signifies a growing loss of faith in the ability of the Democrats to work with labor unions and prevent strikes which have delayed the production of badly needed goods.

The public's attitude on the matter has been charted during the past year in surveys by the institute, the latest of which has just been completed. Voters in these surveys have been asked:

"As you feel today which political party —the Democratic or the Republican—can best handle the problem of reducing strikes and labor troubles?"

The vote today as compared to 8 months ago and 1 yr ago is given below:

	Democratic Party Pct	Republican Party Pct	No Difference Pct
Oct. 1945	41	31	28
Feb. 1946	38	36	26
Today	23	46	31

All occupation groups in the survey show a greater confidence in the ability of the Republican Party to deal with this issue than in the Democratic Party. Professional and business people show greater GOP confidence than any other occupation group, as might be expected, but even among manual workers where the Democrats have the greatest following, the weight of opinion today favors the GOP on the strike-control issue.

The changed attitude is part and parcel of a broad political trend in this country away from the Democratic Party. As reported earlier in the week, surveys by the institute show that Democratic Party strength nationally in early October was at its lowest point in 16 yr. Only 43 pct of voters questioned in the poll said they would vote Democratic if a Congressional election were being held today, while 57 pct favored the GOP.

Four other indexes of public sentiment reported at the same time by the institute also showed declining public support of the Democratic Party.

This poll is further evidence that there has been a major shift of sentiment on some of the principal issues facing the country, as well as on parties and candidates.

•

• • • **It is an easy thing** to place too much emphasis upon the political significance of the meat crisis, which culminated in the decontrol of meats.

The facts of the matter are that two out of every three questioned in a nationwide survey taken at the height of the crisis (before the Truman address) say neither political party is to blame. They place the blame elsewhere.

Only one out of three said they think either the Democrats or the Republicans are to blame.

Of those assigning the blame to a political party, the great majority, rightly or wrongly, name the Democrats.

A tabular presentation of public thinking on the meat issue as the President addressed himself to the nation looks like this:

	Pct
Blame the Democrats	30
Blame the Republicans	4
Blame something or someone other than political party	66

President Truman's action in decontrolling meat was thus based upon a realistic appraisal. For the three in ten blaming the Democrats constitute a voting force large enough to have swung any national election in history.

Public Blames Neither Party For Critical Meat Shortage; Feels OPA and Others at Fault

o o o

The important thing to bear in mind is that the meat crisis is by no means the sole factor accounting for the marked decline in Democratic strength shown in recent institute polls.

The voters who say the fault lies with no political party, who place the blame on something or someone other than the political parties, assign the blame as follows, with the items listed in descending order of importance.

(1) The OPA
(2) The government, Washington, Congress
(3) Meat packers
(4) Profiteers
(5) Farmers
(6) Big business
(7) All people
(8) Extent of meat exports.

Of interest from the above table is the apparent failure of Democratic leaders and others allied with the Democratic cause to convince any substantial segment of the American public that the blame lay with the Republicans, the meat packers, and/or big business. The proportions naming any of these groups as being primarily to blame is relatively small.

At the height of the meat crisis, five separate polls have shown sharp decline in Democratic support, with Congressional sentiment splitting 43 pct Democratic, 57 pct Republican, on a nationwide basis.

Democratic Party strength in terms of Presidential elections is also shown down, as is public approval of the way President Truman is carrying out his job.

Finally, polls of independent voters, who have carried the balance of power in recent national elections, show a sharp swing among this group toward a Republican preference in both Con-

(CONTINUED ON PAGE 128)

A. O. Smith Sued, Says Treasury Placed Pipe Order for Russians

Milwaukee

• • • **Governor Warren's blast** of Oct. 17, charging preferential listing of the 183-mile 20-in. pipeline for Russia has had wide repercussions. The California governor charged that the delivery of this pipeline interfered with a similar line that the El Paso Gas Co. has been trying to obtain, from A. O. Smith Co. in Milwaukee. The line is to run from Texas to Southern California.

A. O. Smith, which was alleged to have taken the order from the Russians, responded that the order was placed by the U. S. Treasury Dept. and was entered on their books long before the El Paso contract was taken. The Treasury Dept. has announced that the order originated with UNRRA for the Ukraine Dept. of the USSR.

Paul Kaiser, president of El Paso Gas Co., has filed suit against A. O. Smith to enjoin them from accepting any orders for delivery prior to their own. The State Dept. later told the press that the UNRRA order would be cancelled. To date A. O. Smith has not received such a cancellation from either of the government agencies and is trying to ascertain through its legal department the nature of the charges lodged against it by the El Paso Gas Co.

Plans to Sell 75 Pct Of Surplus by Jan. 31

Washington

• • • **Plans have been announced** by Administrator Robert M. Littlejohn by which the WAA expects to dispose of 75 pct of current inventories of surplus consumer and capital goods by Jan. 31, 1947.

Instructions have been issued to field offices to put current unsold inventories up for sale as follows:

At least 50 pct to be offered during November, 80 pct by the end of December, and the remainder during January.

Locations at which there is less than $100,000 worth of property (acquisition cost) are to be cleaned out by Jan. 1, using spot sales, bids, auctions and any other suitable methods.

Orders have been issued that an accurate inventory is to be completed by Nov. 15, by every office having a total inventory of less than $100,000; offices having more than that amount are given until Dec. 1.

After these dates, inventory accounting is to be placed and maintained on a current basis, which means that each processing step is to take no more than 24 hr.

Inland Awarded War Plant

Chicago

• • • **The Inland Steel Co.**, which submitted the sole bid on the government-owned East Chicago Plant, has been awarded the property. Inland, wartime operator of the facilities, which has had the plant under lease since the end of the war, paid $13,250,000 for the works that was built by the government at a cost of about $35,000,000.

Under the terms of the sale, Inland has agreed with the National Housing Agency to produce merchant iron for use in the veterans housing program. Inland has the option of producing the required merchant iron at the new plant or at other blast furnace facilities. The expected output of merchant iron as a result of the sale will run between 20,000 and 24,000 tons a month. The company has said that it will continue merchant iron production as long as it receives the $8 a ton subsidy from NHA.

Better Bat Bomb

Washington

• • • The Navy's radar-guided glider bomb, the Bat, is due to be outmoded by later models, which will probably include a means of propulsion. The present missile, capable of carrying a 1000-lb bomb, has a range of only 10 miles and its glider characteristics make it vulnerable to anti-aircraft shells using proximity type fuses. The Bat is about 12 ft long and has 10-ft wing span. Launched from aircraft and directed by radar echoes from targets its accuracy is considerably greater than that of conventional type bombs. Used against Japanese shipping in the later stages of the war, it was the first fully automatic guided missile to be successfully used in combat by any nation. However, because of its radar characteristics it can only be used against isolated land targets. Its primary value is as a naval weapon.

Steel Shortage Causes Tube Investments To Shut Down Subsidiary

London

• • • **Owing to** the growing steel shortage in Great Britain, the Tube Investments group has closed down its subsidiary, Perfecta Tube Co., of Birmingham, manufacturers of seamless drawn steel tubes. At the height of the war period demand, the company was producing tubes at the rate of 1,000,000 ft a month.

The premises are now being used as a service depot and store for other companies in the group, and the staff has been transferred to other works belonging to Tube Investments. In connection with the decision to close down the works, I. A. R. Stedeford, chairman and managing director of Tube Investments, made the following statement:

"The position is that the group's tube production capacity has for some time now been considerably in excess of the dwindling steel supply, and this step has been taken as the best means of maintaining maximum production with maximum efficiency. Nobody has suffered by the close-down. Apart from a few who were pensioned off, or who accepted offers of work elsewhere, the remainder of the staff have been transferred to other Tube Investments works.

"It is, however, most disappointing to have to shut down production capacity at a time when home and overseas demand for tubes is at its highest. Our reconversion plans are so far advanced that we could now fulfill all tube orders at reasonable notice if we could get the steel."

Correction

• • • **Editors, typographers** and proof readers chalked up a new high in errors in last week's article on the new General Motors diesel locomotive on p. 102. The unit develops 6000 hp, and not 600 as stated in the first paragraph. In the first paragraph of column 2, General Motors will continue to build 600 and 1000-hp switchers. And finally, the diesel should be compared on availability with *two* mallet engines.

Steelworkers to Ask Healthy Wage Increase in January

New York

• • • **When Philip Murray,** United Steel Workers of America president, meets with U. S. Steel Corp. representatives in January to start new contract negotiations, it can be expected that his wage hike demand will be substantial. Furthermore, the actual increase for which he will ask may not become generally known until that time.

Earlier this year when controls on prices making up the cost of living index were almost universal, it was expected that Mr. Murray's prime demand for his steel workers would involve a guaranteed annual wage. It now looks as if this request will take a secondary place in negotiations early next year.

When Mr. Murray held out for a 25¢ an hr increase early this year and finally settled for an 18½¢ an hr raise, he apparently expected that the Administration would do something about keeping down the prices for commodities going into the steelworkers budget. He also hoped that the increase would more or less make up in take-home pay the lack of overtime payments which were quite general during the war.

In recent months neither of these expectations have been fulfilled, according to union leaders. The cost of living has skyrocketed and the average hours worked per employee per week in the steel industry have dropped from more than 47 hr a week during the war to about 38 hr per week in recent months.

The steel industry on the other hand has had its labor cost increased by the wage raise last March, by the increased cost of training new employees and by advances in various material costs. So much has this been the case that the industry is continuing to furnish data to the OPA for the purpose of increasing some steel prices which it is claimed are unreasonably low.

From a practical standpoint, however, the worries of the steel industry will have no effect on the demand which it is believed will be placed before steel companies by the union early next year. Prices

By TOM CAMPBELL
News-Markets Editor

o o o

are moving up so fast, union officials insist, that it is too early to indicate at this time what amount the wage increase demand will be.

No light is expected to be thrown on the steelworkers coming demand at the CIO convention in Atlantic City, N. J., this month. The USWA will probably take a long look at current conditions and not make up its collective mind until mid-December when the policy committee of the steel union will meet within international officers to set up a list of wage demands. Not to be overlooked as a definite possibility in the union's list may be a request for a health and welfare fund similar to that obtained from the Government by the United Mine Workers.

The meeting of district steel labor representatives is expected to be noisy in view of the fact that the average take-home pay has dropped from a high of $60 a week in 1945 to between $49 and $52 in recent months, despite the increase granted earlier this year. The statistical reason for this drop in the average weekly take-home pay has been the substantial elimination of overtime for the majority of employees at most steel plants and the increase in the number of new employees in order to support a 40-hr week program.

Steel officials naturally are expected to turn thumbs down on granting any substantial wage increase in February when current contracts run out. It can be certain, according to steel circles, that steel companies will take the stand that any increase in wages must be compensated for by higher steel prices — no matter how reluctant the industry might be to force higher steel quotations.

Philip Murray's promise that current labor contracts will be rigidly adhered to until Feb. 15 required considerable restraint on his part and a more than usual control over the various act of locals. Both sides will sit down at their meetings in January far apart on such questions as the need for higher wages, the alleged drop or increase in worker efficiency and the general basic difference between the economic thinking of the two either groups.

Take-Home-Pay In Steel

New York

• • • The following figures indicate the peak to which average weekly earnings went during wartime but also indicate the substantial increase of current weekly earnings over prewar take-home pay. They also indicate why a healthy wage increase will be sought.

	Month	Average Weekly Take-Home Pay
1944	October	$54.63
	November	57.24
	December	54.00
1945	January	58.67
	February	59.00
	March	60.20
	April	58.59
	May	60.10
	June	56.70
	July	55.25
	August*	50.63
	September	50.30
	October	50.04
	November	51.11
	December	47.58
1946	January-February	31.44
	March**	51.17
	April	49.85
	May	44.34
	June	46.36
	July	49.32
	August	51.98

* War ends
** 18½¢ an hr wage increase

Figures shown above are based on American Iron & Steel Institute data. The average weekly earnings were obtained by multiplying the average hours worked per week per employee by the average earnings per hour. The latter includes overtime, retroactive pay and vacation allowance.

Youngstown Profits Jump

Youngstown, Ohio

• • • **Youngstown Sheet** & Tube Co. has reported net profit of $4,871,852, equal to $2.91 per common share, for the third quarter ended Sept. 30. This compares with a net of $1,627,080 or 97¢ a share, in the corresponding period a year ago.

Directors have voted the regular quarterly common dividend of 75¢ a share and an extra dividend of 50¢ a share. Both are payable Dec. 16 to stock of record Nov. 23.

WAA Announces Its Interpretation of The Term "Small Business"

Washington

• • • **Because "small business"** may buy surplus goods with priorities and is not defined in the Surplus Property Act, WAA, responding to requests from its regional directors and zone administrators, has interpreted its definition of the terms. Its standard definition remains unchanged: It says that small business is any commercial or industrial enterprise or group of enterprises under common ownership or control which does not have at the date of purchase of surplus property more than 500 employees, or any such enterprise which by reason of its relative size and position in its industry is certified by WAA to be a small business.

Field officials desired more specific criteria for their guidance in arriving at determinations of small business when factors other than number of employees were to be used as the basis for determination.

The new interpretation sets the following standards for "size" and "position":

(1) A small business may be defined as an independent commercial, industrial or agricultural enterprise, or group of such enterprises, under common ownership or control, which is not dominant because of its size or standing in its specific field of business; and

(2) Is not financially or otherwise in any way controlled by a commercial, industrial or agricultural enterprise which occupies a dominant position in its field of business activity.

Wholesalers buying without priority are permitted to purchase surplus goods at lowest prices if they sign an agreement to resell it only to small business as defined by WAA.

Only two classes of small business buy war surplus goods with priorities:

(1) The veteran who is establishing himself in a small business (this group has No. 2 priority).

(2) Small business buying through the RFC (this group has No. 3 priority).

It is WAA's responsibility to make the definition pertaining to the first group, and RFC's responsibility for the second group of buyers. By joint agreement, the two agencies have adopted similar definitions.

Armco Expands at Butler

Butler, Pa.

• • • **Steel production** at the Butler Div. of American Rolling Mill Co. will be increased from 591,000 to 750,000 tons annually as a result of a $10 million expansion program now underway.

Plans include an electric melting furnace, several electrical annealing furnaces, changes to the strip rolling mill to speed it up and auxiliary equipment and storage space to handle the increased tonnage.

The new facilities, which are expected to be completed in 1948, will increase employment from 3800 to 4000.

Armco's Butler Div. produces specialty grades of sheet and strip, including stainless and electrical.

Lake Iron Ore Totals

Cleveland

• • • **Consumption of** Lake Superior iron ore in September totaled 6,380,155 gross tons, raising 1946 cumulative consumption to 43,820,885 gross tons. Iron ore stocks on hand at furnaces and Lake Erie docks Oct. 1 totaled 37,572,950 gross tons, compared with 34,066,987 gross tons on hand Sept. 1, and 39,549,055 on Oct 1, 1945. Blast furnaces depending principally on Lake Superior ore numbered 165 in the United States and three in Canada. Idle furnaces numbered 22 in the U. S. and seven in Canada.

Still at It

Washington

• • • The Federal Trade Commission has requested the Dept. of Justice to ask the Supreme Court to review the recent decision of U. S. Circuit Court of Appeals in Chicago which turned thumbs down on the FTC's basing point case against the cement industry. The Court said that the system as operated by that industry does not violate the anti-trust laws. Great importance has been given the case inasmuch as affects similar proceedings in steel and other industries, which like the cement industry, use the multiple basing point system as a means of arriving at delivered prices.

It is expected that the Dept. of Justice will act soon and favorably in the FTC request for a writ of certionari, though it has 90 days in which to do so.

Munitions Board May Now Issue HH Ratings

Washington

• • • **CPA has, through** amending Directive 41, delegated authority to the Army and Navy Munitions Board to issue HH preference ratings, instead of the higher MM ratings, for military housing projects in the United States. These ratings may be used for all building materials listed on Schedule A to PR 33, except construction lumber and construction plywood for which MM ratings still are authorized. The ANMB retains unchanged authority to issue MM (military) ratings.

Schedule A to PR 33 currently contains a list of 66 groups of scarce building materials for which HH (housing) ratings may be issued to builders and other authorized persons under PR 33 (Veterans' Emergency Housing Program.)

Blaw-Knox Co. Buys Plant

Pittsburgh

• • • **Steel facilities** in the Lawrenceville district that cost the government $2,650,000 were sold this week to Blaw-Knox Co., for $375,000. The bid of the company for the plant, to operate under its Union Steel Castings Div., was approved by the regional office of the War Assets Administration.

The plant employs about 700 and is a steel foundry. During the war the facilities were used in the production of tank armor.

Being an integral part of the Union Steel Castings Div. plant, the government deemed it inadvisable for other companies to submit bids.

Thomas Steel Profit High

Warren, Ohio

• • • **Thomas Steel Co.,** reporting net profit of $329,979 for the third quarter of 1946, has earned more money in the first 9 months of this year than it did in all of 1945. Third quarter earnings, based on sales of $2,510,000, were equal to $16.50 a share of preferred stock and 91¢ on common. For 9 months net income reached $718,646, equal to $35.95 on preferred and $1.94 a common share. This compares with $500,279 for all of 1945.

Allegheny Ludlum Steel Reports Third Quarter Net at 8.6 Pct of Sales

Pittsburgh

• • • **The $2,113,012 net** for the third quarter reported by Allegheny Ludlum Steel Corp. represented 8.6 pct of its total sales of $24,559,755. Earnings for the entire 9 months of 1946 totaled $4,559,139. The third period earnings compare with $2,194,185 earned during the second quarter and with $537,079 earned during the third quarter of 1945. Earnings for the first 9 months of 1945 totaled $2,500,866. **Earnings for** the 9-month period of 1946 were 6.8 pct of sales, whereas the earnings for the third quarter of 1945 were 2.7 pct of sales and for the first 9 months of 1945 were 3.2 pct of sales.

Officials of the company believe that the demand for flat rolled stainless will continue at its present high level at least through 1947, but the balancing of customer inventories and new capacities to be added soon to the industry will have a definite effect on the order pattern of each producer toward the latter part of next year. Allegheny Ludlum, booked solid for the first half of 1947, has not opened its order books beyond that point. Carryovers are now running about 15 days' production at present capacity of the company, but the additional steelmaking capacity to be added very shortly when a new 50-ton electric furnace becomes operative may reduce this carryover quickly. While stainless bar production is just about 50 pct of capacity for the industry, no weaknesses in price are yet apparent.

The carbide end of Allegheny Ludlum's activities is encouraging to the company from the standpoint of the variety of new uses developing for these materials. Typical is the present development of a new sectionalized carbide die for stamping electrical laminations from high silicon strip.

Republic Steel Reports Net Income for 1946

Cleveland

• • • **Republic Steel** Corp. has reported a consolidated net income for the third quarter of 1946 of $5,039,071 after all charges, including federal income taxes. Third quarter earnings compare with $4,802,756 for the second quarter of 1946 and are at the rate of $.81 per share of common stock as compared with $.78 for the previous quarter. A provision for federal income taxes of $3,500,000 was made for the current quarter.

Earnings for the first three quarters total $9,494,414 and are at the rate of $1.45 per share of common stock, as compared with $7,973,927 or $1.16 per share for the same period in 1945.

ALLOY STEEL PRODUCTION TRENDS: *Latest figures on alloy steel production indicate previous predictions that postwar trends in the output of this steel would show a decline from wartime peaks but at the same time would not drop to the prewar figure which averaged 6 pct of total steel output. During the first 9 months of this year the relationship between alloy steel and total steel production has assumed the pattern which was prevalent early in 1941. For the three quarters of 1946 alloy steel output constituted about 9 pct of total steel production. Little change from this relationship is expected in the near future. It is also noted that openhearths have again taken a stronger position with respect to alloy steel production.*

Alloy Steel Production v. Total Steel Output

1939-1946

Net Tons. 000 Omitted

YEAR	Alloy Steel Production	Alloy Steel Pct of Total Steel	Total Steel Production
1939	3,212	6.1	52,799
1940	4,966	6.3	66,983
1941	8,206	9.9	82,839
1942	11,526	13.4	86,032
1943	13,116	14.8	88,873
1944	10,497	11.5	89,642
1945—January	908	12.6	7,206
February	862	12.0	6,655
March	992	12.9	7,708
April	918	12.6	7,292
May	897	12.0	7,477
June	793	11.6	6,842
July	732	10.5	6,937
August	502	9.3	5,736
September	495	8.3	5,983
October	489	8.7	5,598
November	517	8.3	6,201
December	494	8.2	6,051
1945—Total	8,599	10.8	79,736
1946—January	327	8.4	3,872
February	130	9.3	1,393
March	531	8.2	6,507
April	528	9.1	5,806
May	394	9.7	4,072
June	543	9.7	5,625
July	603	9.1	6,610
August	659	9.6	6,887
September	586	9.0	6,518
1946—Total	4,301	9.1	47,290

Trends in Alloy Steel Production—Openhearth v. Electric

1939-1946

Source—American Iron & Steel Institute. Compilation—The Iron Age

Net Tons. 000 Omitted

YEAR	ALLOY STEEL OUTPUT				
	Openhearth		Electric		
	Production	Pct of Total	Production	Pct of Total	Total Production
1939	2,462	77	750	23	3,212
1940	3,679	74	1,287	26	4,966
1941	5,743	70	2,463	30	8,206
1942	8,133	71	3,393	29	11,526
1943	9,221	70	3,895	30	13,116
1944	6,974	66	3,553	34	10,527
1945—January	610	67	298	33	908
February	578	67	285	33	863
March	669	67	323	33	992
April	596	65	323	35	919
May	574	64	323	38	897
June	520	66	273	34	793
July	495	68	237	32	732
August	339	68	163	32	502
September	358	72	137	28	495
October	340	70	149	30	489
November	375	73	142	27	517
December	358	72	136	28	494
1945—Total	5,812	68	2,789	32	8,601
1946—January	231	71	95	29	327
February	89	68	41	32	130
March	402	76	128	24	531
April	363	69	165	31	528
May	252	64	141	36	394
June	396	73	148	27	543
July	457	76	146	24	603
August	492	75	167	25	659
September	442	75	144	25	586
1946—Total	3,124	73	1,175	27	4,301

USES Predicts No Change In Present Employment Trends

STEADY TREND: *Employment trends were found to be steady by the USES office covering Ohio, Michigan and Kentucky. These states are considered to be a good cross-section of the United States.*

Cleveland

• • • **Current employment** trends give no indication of a drop in business activity in the immediate future, according to J. Kimball Johnson, United States Employment Service regional director for Ohio, Michigan and Kentucky.

"Contrary to rumors and predictions being circulated, some based on the recent decline in the stock market, employment in 3811 plants located in the 3-state region continued to increase from 2,257,500 in July to 2,327,800 in September, a net gain of more than 70,000 or about 3 pct," Mr. Johnson pointed out.

These employers stated their current production schedules called for hiring 89,000 additional workers during the Sept. 15-Nov. 15 period. By Jan. 15, 1947, a net increase of 98,000 workers, more than 4 pct above their September employment, is anticipated, he added.

Employment in 404 plants engaged in the production of iron and steel and their products in this region increased from 298,700 in July to 308,300 in September. These employers state their current production schedules require the hiring of 17,000 additional workers by Nov. 15.

"Three-fourths of the workers employed in the 3811 plants are engaged in manufacturing activities, but a separate tabulation shows their anticipated employment increase is much greater both in actual numbers and on a percentage basis than the number of additional workers to be needed by the nonmanufacturing plants included in the survey. This difference is due to the fact that many of the manufacturing plants will have seasonal employment declines during the latter part of September-January period.

"Current production schedules indicate increasing employment and a lengthening of the work week, and at the present time it appears that qualified workers will not be available in sufficient numbers to meet the manpower needs of expanding production schedules," the USES regional director declared.

"It should be added that because of shortages in certain skilled occupations and because of shortages in critical materials, the anticipated employment level, referred to above, probably will not be attained," he added.

"The growing shortage of workers is not a new development," Mr. Johnson said. "It has been reflected for some time in the increasing number of unfilled job openings in the local USES offices of this region at the end of each month."

Specific qualified workers, shortages include the foundry trades, molders and core makers, tool room skills, machinists and machine operators. There is also a shortage of unskilled labor, particularly in the foundries. At the same time, turnover is increasing, with Michigan showing a higher rate of turnover than Ohio.

At the end of June, USES offices in this region reported less than 51,000 unfilled jobs in their files The number of unfilled jobs increased in each of the following 3 months, so that by the end of September, over 72,000 were reported as unfilled, despite a substantial increase in the number of jobs filled by the USES offices during this period.

The huge drop in the number of both veterans and nonveterans receiving unemployment benefits in this region is further evidence of tightening labor markets.

A comparison of September employment levels in 2180 manufacturing plants with their levels just prior to V-J Day shows that despite a very sharp reduction in manufacturing employment immediately after the ending of the war last August, the volume of manufacturing employment in this industrial region is only 4 pct below the figure for July, 1945. Manufacturing employment in the region, while still slightly below VJ-Day, has reached unprecedented peacetime levels.

There has been a tremendous increase of employment in the non-manufacturing industries, particularly in the service trades

	Number of Plants	Actual		Anticipated	
		July 1946	September 1946	Novmeber 1946	January 1947
Louisville	200	76,859	79,066	81,658	82,877
Detroit	500	558,800	581,600	601,400	604,000
Cleveland	289	237,582	243,160	249,287	248,582
Cincinnati	206	121,638	123,843	127,625	126,120

Ed. Note—Because of the composite of manufacturing in Ohio, Michigan and Kentucky, it is considered an ideal area for determining employment trends.

and construction activities, Mr. Johnson pointed out.

"While we do not know exactly how many additional workers were hired by these industries since the end of the war, we know that despite the employment of hundreds of thousands of war veterans returning to the region and while manufacturing employment has not yet quite attained VJ-Day levels, the number of unemployed is relatively low. Less than 225,000 persons, including both veterans and nonveterans, are receiving unemployment benefits, and of these beneficiaries, more than half the veterans have no previous industrial experience and a large proportion of the nonveterans are women whose work experience is limited to war plants."

Recent trends of employment, in plants surveyed by the USES for the four major cities of the region, are shown in the table.

English Auto Companies Decry Sheet Steel Cut

London

• • • **John Wilmot,** the British Minister of Supply, has recently received a deputation from the Society of Motor Manufacturers & Traders Ltd., warning him of the effect which the proposed reduction of allocations of sheet steel would have on the British motor car industry next year.

It was pointed out that before the war nearly 40 pct of the British sheet steel production went into the automobile industry, whereas the proposed allocation was only about 15 pct. This would be sufficient for only half the production planned for 1947.

Mr. Wilmot said that the present situation has arisen on account of loss of imports and the enormously increased consumption, resulting in demand exceeding even the present enlarged rolling capacity.

Czech Raw Iron Output Tops Record for Year

Prague

• • • **Czechoslovakia's output** of raw iron during August was the highest yet recorded this year, exceeding the July total by 4.5 pct As against August last year when 46,200 tons were produced, the output has been almost doubled.

The production of raw steel during August this year exceeded the total for July by 7.8 pct, and development of the Czechoslovakian iron and steel output from May to August this year is as follows:

1946	*Raw Iron*	*Raw Steel*
	(net tons)	
May	89,100	161,700
June	86,900	159,500
July	88,121	135,708
August	90,718	146,413

Supplies of iron ore, on which the output of the Czechoslovakian foundries is chiefly dependent, are rapidly improving, and several weeks ago the first 7100 tons of iron ore from Sweden arrived by way of Gdynia. Negotiations are now in progress for long term deliveries of supplies from the USSR.

Decontrol Export Sales

Washington

• • • **Sales and deliveries** of several metals and minerals when sold by RFC or its subsidiaries for export have been exempted from price control, OPA has announced. The commodities exempted from control only when sold by the RFC for export, beginning Oct. 24, 1946, follow: antimony, metal and oxide; asbestos; copper; corundum; lead; manganese ore; nickel; quartz crystals; zinc. Export sales of these commodities are and will continue to be made only upon allocation or recommendation of CPA.

SUMMARY OF UNITED KINGDOM STEEL STATISTICS

Source: British Iron & Steel Federation

All Figures Thousands of Net Tons	STEEL			PIG IRON	SCRAP	IRON ORE	
	Ingots and Castings	Finished Deliveries	Steel Stocks (1)	Production (2)	Steelmaking Consumption	Imported Ore Consumption	Home Production
1944 Total	13599.0	11502.4	2431.5	7542.0	8252.6	2725.6	17332.2
1945 Total	13237.8	9992.3	1885.9	7959.4	8065.9	4494.7	15870.4
1945 August	1041.0	796.8	1434.4	701.1	619.3	436.2	1239.2
September	1077.8	792.5	1415.4	624.9	650.0	438.1	1102.5
October	1360.8	932.4	1356.8	818.1	818.1	595.2	1385.4
November	1106.1	803.7	1358.0	672.0	659.9	467.7	1115.5
December	992.3	735.6	1332.4	651.8	592.7	449.7	1036.6
1946 January	1025.0	971.0	1370.9	803.6	754.8	541.5	1373.6
February	1107.5	833.2	1341.5	654.5	657.2	445.8	1147.3
March	1145.5	898.6	1314.7	659.9	695.2	484.2	1148.6
April	1129.4	827.0	1265.1	666.1	682.7	499.0	1090.8
May	1466.0	1139.0	1283.6	846.7	890.9	644.5	1371.4
June	1074.3	859.2	1266.3	678.7	640.1	531.7	1010.2
July	1012.9	791.1	1299.8	658.5	616.0*	534.9	986.9
August	1265.0	968.2	1342.7	813.6	749.2	665.8	1252.1

[1] Held by producers and in British Iron & Steel Corp. stockyards at the beginning of the years and months shown.
[2] All qualities, including ferroalloys.
* Revised.

Canadian Mills Resume Output With Order Books Closed on Many Items

Toronto

• • • Canada's three big basic steel mills are gradually swinging back into production following the strike that tied up operations and output for 81 days and resulted in a loss in steel ingot production of about 425,000 tons. Already shipments of steel have been resumed to various fabricating plants across the Dominion, but the supply is still well below actual requirements. The flow of steel from the Hamilton Works of the Steel Co. of Canada Ltd., where partial production was maintained during the strike, is being maintained at a fairly high rate but there are still some items that have not yet started to roll off the finishing mills.

Algoma Steel Corp., Sault Ste. Marie, reports that steps leading to full production are making rapid progress, while Dominion Steel & Coal Co., Sydney, N. S., made its first steel last Tuesday and officials state that they expect the mills to be in full production within two weeks. It is not expected, however, that the big producers will attain full production schedules much before the end of the year.

Mill representatives state that while they are not interested in new business at the present time, numerous inquiries are being received and consumers are endeavoring to place orders for delivery at the earliest possible moment. According to H. G. Hilton, president of the Steel Co. of Canada Ltd., all materials for the housing program and for oil heating are being given priority with particular emphasis being laid on steel sheets and wire nails. A barter or trading system has developed among various interests that are in urgent need of various materials. One person may have a supply of nails and is in dire need of cement or some other material, so he advertises or looks around until he can find someone with a surplus of the things he wants and a trade takes place. This condition prevails in practically all materials that are in short supply.

While production again is under way and gradually being increased, officials of the various steel companies point out that it will be months into the future before they can catch up with back orders and as a result are not interested in adding to their commitments at this time. On steel sheets backlogs are in sufficient volume to absorb all production to the end of first quarter and mills are not opening books for additional orders. On plate and steel bars mills are booked solid to the end of this year and also report that their commitments may extend well into the first part of 1947.

Although there is a possibility that pig iron deliveries to the merchant trade by the big producers may be resumed within the next 2 or 3 weeks, it will be the end of the year before they can catch up with back orders and enable melters to get back to more normal operations. It is not expected, however, that pig iron output will go above 60 pct before next spring as the coke supply, a large part of which is being turned into civilian channels to relieve coal shortage, will not be adequate to meet blast furnace needs and supply outside consumers. Also a number of blast furnaces now are down for repairs. A coal strike in the United States would have further serious effect on Canadian pig iron production, as well as Canadian steel mill operations in general.

It is reported that the pentup demand for wire nails will take at least 2 yr to clear, and in the meantime building operations all across Canada are being seriously hampered. While nail production again is under way by Dominion Steel & Coal, Graham Nail Works, a subsidiary, and by the Steel Co. of Canada Ltd., output runs far short of meeting domestic demands and producers are not interested in taking on additional commitments at this time. Imports of nails, and various other steel items from the United States command higher prices than Canadian ceiling prices and so far the government has granted no concessions in the way of price increases to manufacturers to absorb the higher costs. Imported nails are finding a ready market at three to four times the domestic ceiling price.

Coming Events

Nov. 7-8 National Founders Assn., New York.

Nov. 14-15 National Metal Trades Assn., convention, New York.

Nov. 15-24 National Aircraft Show, first annual exposition, Cleveland.

Nov. 17-22 American Welding Society, Atlantic City, N. J.

Nov. 18-22 National Metal Congress and Exposition, Atlantic City, N. J.

Dec. 2-4 Society of Automotive Engineers, air transport meeting, Chicago.

Dec. 2-7 National Power Show, New York.

Dec. 5-7 Electronic Microscope Society of America and American Society for X-ray & Electron Diffraction, joint meeting, Pittsburgh.

Dec. 5-7 Electric Furnace Steel Committee of Iron & Steel Div., American Institute of Mining & Metallurgical Engineers, annual conference, Pittsburgh.

Dec. 9-11 Society for Experimental Stress Analysis, New York.

Jan. 6-8 Institute of Scrap Iron & Steel, Inc., convention, New York.

Jan. 27-31 Electrical Engineering Exposition, New York.

Jan. 27-31 International Heating and Ventilating Exposition, Cleveland.

Jan. 28-Feb. 2 Society of Plastics Engineers, exhibition, Chicago.

The London ECONOMIST

The Menace of Atomic War

Reprinted by special permission to further understanding on how political and economic affairs are viewed in London.

o o o

THE debate in Parliament on the government's Atomic Energy Bill coincides with the unanimous decision of the political committee of the United Nations Atomic Energy Commission at Lake Success to proceed to examination of the safeguards required in control of atomic energy if it is to be restricted to peaceful uses. This decision has followed on the report of the scientific and technical committee, which was adopted on Sept. 26 and which stated that, from a technological point of view, effective international control of atomic energy was feasible.

It is clear that international discussions on this crucial question have reached a stage at which there is an encouraging prospect of real achievement. Yet the way forward is beset with risks of paralyzing disagreement, and as long as no knaveproof pact for the prohibition of atomic warfare is attained by the nations of the world, the terrible menace of the most destructive weapon ever devised by man remains with us. There is no time to be lost, for the means of atomic warfare are all the time being increased, and the nature of this weapon is such that their very existence may precipitate the dreaded conflict.

It is admitted that the United States is continuing to produce and store atomic bombs and is also actively experimenting to obtain still greater explosive force and to discover new methods of delivery. It is universally believed, though without direct evidence, that Russia is striving to produce similar bombs at the earliest possible date. No other country is known to be making them and the American government has officially denied the report put out by the notoricus sensation-monger Drew Pearson that Britain has been lent a number of the bombs which are stored somewhere in the north of England for use in an international emergency. Apart, however, from actual production, there is no doubt that any nation with sufficient scientific and engineering capacity, access to suitable materials, and willingness to devote enough of its industrial resources to the manufacture, could produce them in a few years' time.

AN international situation in which only two Great Powers, divided by sharp antagonisms on major political issues, were possessors of the means of atomic warfare could but complete the schism of humanity into two rival camps, for there would then be no balancing or neutral power factors of importance left in the world. It is hardly to be expected that peace could long be maintained in such a world; the competition of orbits would sooner or later end in uncontrollable violence. And of all the weapons of war which have existed, the atomic bomb is the one which puts the highest premium on the sudden, overwhelming surprise blow—the technique of the original Nazi Blitzkrieg and of Pearl Harbor.

For this reason all machinery for prevention of war which depends on a normal procedure of negotiation or mediation, summonings of international bodies or hearings of cases, would be too slow to take effect at the moment of crisis. An aggressor, hoping to get in the first blow and beat down all opposition by speed of attack, would still reckon, in Hitler's words, that "nobody will ask the victor whether he spoke the truth or not." And even rulers without aggressive intention may be led into initial attack by the belief or fear that the other side is about to attack.

The only way to deliver mankind from the fear of atomic war, and the actions which that fear would produce, is to obtain an agreed prohibition of the bomb with an international inspectorate to enforce it. A Kellogg Pact of outlawry without inspection or sanctions would not reassure mankind, but would only have the effect of either increasing suspicions and alarming rumors or else of lulling the more well-intentioned nations into a false sense of security to the advantage of the more bellicose who might secretly violate the prohibition. Those who believe that a mere undertaking by governments not to use the bomb would be enough often base their argument on the fact that neither side used gas in the last war.

On the other hand, many other agreed laws and conventions of war were broken, and on the evidence of what the Nazis were not deterred from doing, it is hard to imagine that Hitler would not have ordered chemical warfare if his military advisers had confirmed that he could get greater advantage from it than from other means at his disposal. If it is said—as Mr. Wallace is inclined to say—that we cannot get anywhere in international affairs without mutual trust, the answer surely is that, even in those social relations of daily life from which the wilder forms of violence and terror have been eliminated, trustfulness is supplemented by precautions; banks do not pay money over the counter on demand without checks and people are considered foolish who leave valuables in places where they invite theft—yet in such matters there are always the police and prisons in the last resort to restrain the swindler and the rogue. Why then should anyone in international relations expect the unsupported word of a government to be sufficient for se-

(CONTINUED ON PAGE 126)

UNRRA Sets Chinese Farm Implement Goal at $21 Million

By GENE HARDY
Washington Bureau

Washington

• • • **Initial production** of some $21,000,000 worth of hand agricultural implements is the goal set by UNRRA for a budding Chinese industry now being partially restored by the relief agency.

This program, to cost about $6,500,000 will give the Chinese a nucleus around which to build an industry capable of meeting the needs of the agricultural population for the special tools peculiar to the Orient. The project is designed to produce the types of tools that have been used for centuries, but with greater efficiency than ever before through the introduction of American machines and methods.

Faced with a critical need for increased food production in China, UNRRA and the Chinese Government, in the fall of 1945, began discussions looking toward production of farm tools. During the war years, practically all of the agricultural implements in China found their way into the Japanese war industry in the form of scrap.

At first, it was thought possible to procure the needed tools in the United States. However, lack of specifications of the varied types used throughout China and the fact that the number of tools to be made before UNRRA pulls out of the picture next March was relatively small relegated this proposal to the ash heap.

A single, large factory in China was then considered. Lack of adequate transportation and the demand for thousands of different types of tools, some which are peculiar to single localities, resulted in the junking of this plan.

In the meantime, UNRRA procured several surplus mobile units, which got the program started on a small scale in July 1946.

The permanent program, now under way, calls for the construction of a large shop in Shanghai, 18 smaller but similar shops located in the various provinces; and 3000 small blacksmith and forge shops scattered throughout the country.

Most of the buildings will be surplus Quonset huts of various sizes, but suitable structures that have not been destroyed are also being utilized.

° ° °

The Shanghai installation will be in production within the next month. The first items expected to be turned out are hoes and sickles.

During the early stages of the program, the major share of the production will come from the Shanghai plant, while the smaller units will be engaged primarily in repair work. As the work progresses, it is planned to produce tools at all of the shops with the smallest units turning out tools peculiar to the individual locality.

UNRRA will retain control of the operation until the initial $21,000,000 worth of tools has been produced to assure that the equipment is used for its intended purpose. After UNRRA lets go, the Chinese Government will take over. The smallest shops will be sold to individuals in the area of location. Selling price will be the production of a fixed number of tools. The tools will be sold to the Chinese peasants, where there is evidence of ability to pay. The prices will be fixed by the Chinese Government subject to UNRRA okay.

The central plant in Shanghai is being laid out on conventional lines. The central foundry equipment includes two overhead cranes, one yard crane, two gray iron cupolas, one malleable iron cupola, grinders, molding machines, brass furnaces, aluminum furnace, and all accessories including hand and pneumatic tools.

Included among the equipment of the central forge shop are the following items: One 3000-lb drop hammer, two 2000-lb drop hammers, several smaller hammers; forging and annealing furnace, alligator shears, power saws, grinders, one 200-ton hydraulic press, a completely equipped hardening room, and all other necessary equipment.

The cold metal shop will be primarily a welding outfit, but will include some pipe working tools. The central machine shop will contain 11 different types of lathes as well as grinders, shapers, milling machines, planers, power saws, gear hobbers and the other necessaries. Completing the layout will be a carpenter shop and a pattern shop.

In addition to the production of tools, the Shanghai layout will provide the 18 major regional shops with blanks and handle repair work sent from these shops.

The regional shops will be equipped as smaller editions of the central layout. They, in turn, will supply the 3000 blacksmith and forging shops and also handle repair work, in addition to their production of tools.

The equipment in the smallest units will cost about $500 for each shop, and 1500 of these will be equipped with supplies from Australia with the other 1500 drawing their equipment from the United States.

Most of the machine tools are being contracted for in the United States. A major portion of the equipment is being drawn from surplus stocks.

The breakdown of material and equipment sources is as follows:

New	36 pct
Second-hand from private sources	3 pct
Australia	18 pct
Pacific surpluses	10 pct
Domestic surpluses	33 pct

UNRRA will supply the required raw materials for the initial part of the work, since China is practically denuded of the types of needed material. However, China

Among Those Present

Washington

• • • **Sponsored by the United States, the World Conference on Trade and Unemployment will probably be held in late 1947. In the meantime, meeting in London this month to draw up a charter for the proposed ITO and make preparations for the gathering are representatives of the following nations:**

United States, England, Russia, France, China, Canada, Australia, Holland, Brazil, Chile, New Zealand, South Africa, India, Norway, Belgium, Luxembourg, Czechoslovakia, Lebanon and Cuba.

will supply considerable scrap.

Of the approximately 60,000 tons of raw materials required from outside sources, about half will come from Australia. Included among the materials which UNRRA hopes to get from Australia are 20,000 tons of pig iron and 6600 tons of steel billets. Other materials allocated to the program in relatively small quantities include coke, blacksmith coal, bar stock, plate, sheet, strip and some structural steel.

In terms of money, UNRRA has allocated the funds in the following manner:

Equipment	$3,000,000
Materials	$2,000,000
Blacksmith shops	$1,500,000

UNRRA has 30 mechanical engineers in China working on the program. One engineer will be assigned to each of the regional shops; the remainder will work out of Shanghai. A considerable portion of their work will be training Chinese personnel in the use of the American machines and techniques being introduced.

Harriman Stresses Full Employment for Stable Economy

Washington

• • • **Sworn in** as Secretary of Commerce recently, W. Averell Harriman sounded as the keynote to maintenance of a high level of employment, "more goods for the security and better life for everyone" as stable and rising production. The oath was administered by Chief Justice Fred M. Vinson, as Mr. Harriman's hand rested on the Bible of the late Gen. Hugh A. Johnson. Mr. Harriman was assistant to General Johnson when the latter was the chief guardian of the Blue Eagle.

The former Ambassador to Great Britain and Russia, who is also chairman of the Union Pacific Railroad, declared that more and steady production is the most solid foundation for the prosperity of the country as well as the peace of the world. People of the world, he pointed out, are looking to this country for leadership in solving the economic, as well as the political, problems that face us all.

Mr. Harriman, who has served the government in different capacities since the early days of the Roosevelt regime, said that he believes there is little difference of opinion in the United States as to these fundamental objectives, but that there are naturally wide disagreements as to the methods by which they can or should be attained.

"The Dept. of Commerce has as its basic responsibility to assist the sound development of the industry, production and trade of the United States," he said. "It has the obligation to play its part in carrying out the politics of the Congress, to cooperate with other departments and agencies of the government to meet these fundamental objectives. The Dept. of Commerce must, too, render all the assistance within its power to aid business in the United States, particularly small business, in taking advantage of the opportunities which exist to meet the needs of the people."

Mr. Harriman said that his predecessor, Henry A. Wallace, is "a warm, personal friend of mine," and said he had arranged to get Mr. Wallace's thoughts in development of the Department. Unlike Mr. Wallace, however, Mr. Harriman went on record as a firm supporter of the Administration's foreign policy. Mr. Wallace's opposition to the government's foreign policy caused a break with the President that was so serious as to bring about Mr. Wallace's dismissal.

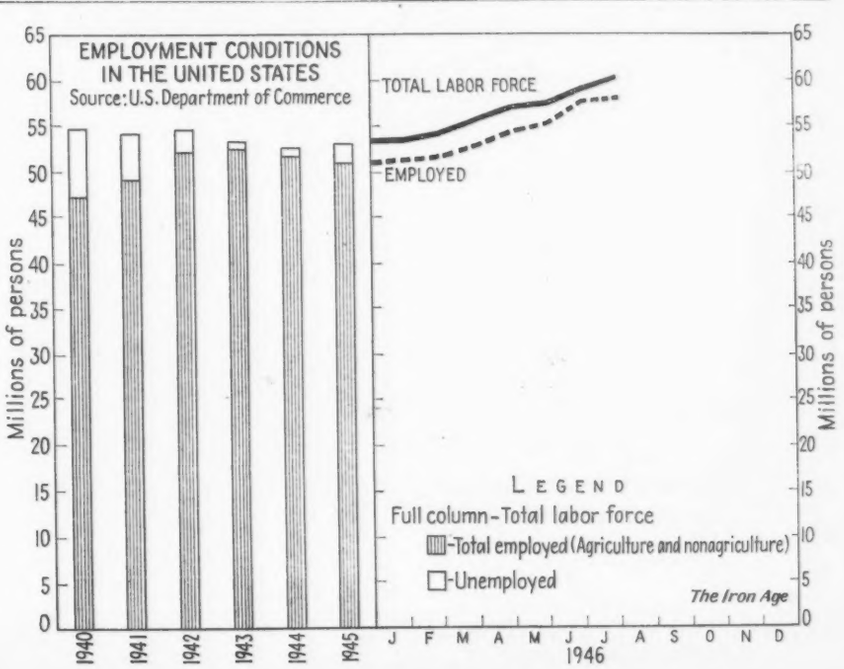
Secretary Harriman declared that although he personally is generally regarded as "big business," he is tremendously interested in "small business" which he considers vitally necessary to the welfare of the nation and its industry.

The first conference he held was with the Small Business Div. of the Department. Conferences with other division heads followed.

Hourly Earnings Rise

Washington

• • • **Preliminary estimates for** August average hourly earnings indicate a further rise of $1.11 per hr, accompanied by a rise in the average work week resulting in an increase in weekly earnings of about $1.25 to $44.61, the Bureau of Labor Statistics, U. S. Dept. of Labor reports. In the field of durable goods weekly earnings during August were at an average of $47.43; hours worked during the week 40.1 and hourly earnings, $1.18.



Industrial Briefs...

• SILVER ANNIVERSARY — The 25th anniversary of G. F. Wright Steel & Wire Co., Worcester, was observed during the week of Oct. 7.

• MODERN OIL LAB.—The placing in operation of one of the nation's largest and most modern fuel oil laboratories has been announced by Gulf Oil Corp. Officials of Gulf at the same time forecast a national increase of at least 50 per cent in home heating by oil by 1950.

• BAKELITE AWARD—F. H. McGraw & Co., constructors, of Hartford, Conn., has been awarded a contract totaling several million dollars by the Bakelite Corp., a unit of the Union Carbide & Carbon Corp., New York, for the construction of a manufacturing plant at Ottawa, Ill. The contract calls for the construction of a manufacturing building covering 135,000 sq ft.

• WAA PLANT SALE—WAA has announced that two sections of the Milwaukee Ordnance Plant, which cost $12,354,513, have been sold. The Steel & Tube Products Co., Milwaukee, purchased that portion of the plant known as the "Center Section" for $750,000. According to WAA, the purchaser expects to add 175 employees to its payroll in the production of stainless steel and other types of tanks. Building No. 113 was sold to the Kay-Gee Corp., Milwaukee, for $52,000. The purchaser, according to WAA, intends to engage in the warehouse business and handle steel, iron and other metal products. It is a small company recently organized by returned World War II veterans.

• MERIT MEDAL WINNER—K. T. Keller, president of Chrysler Corp. has been presented the Medal for Merit by Secretary of War, Robert P. Patterson, for services rendered to the Chief of Ordnance during the war.

• COOPERATIVE AGREEMENT — Completion of a long-term cooperative agreement has been announced jointly by C. G. Frantz, president of Apex Electrical Mfg. Co. and W. C. Pegley, managing director of Vactric, Ltd., London, England. Apex will make available to the British firm its engineering services, production techniques, designs and patents to enable Vactric to manufacture in Great Britain washing machines similar in type to the internationally-known product made by Apex over a period of many years.

• SERVICE HANGAR—Cessna Aircraft Co. is planning construction of an $80,000 service hangar at Pittsburgh Municipal Airport, which will be completed this year.

• STAINLESS—The long awaited beginning of operations of Washington Steel Corp., seems to be definitely assured for late January or early February. Motors and electrical controls have been the bottleneck, mainly the result of the long strike at Westinghouse Electric Corp. The company has been doing some sheet polishing on a contract basis for the past several months.

• WAA APPROVALS—Alabama projects recently approved by the CPA include construction estimated to cost $42,000 on a pipe fabricating shop and store room at Fairfield Steel Works of the Tennessee Coal, Iron & Railroad Co., Birmingham. Also approved was a $34,000 application by the Rudisill Foundry Co., Anniston, for work on a cast iron pipe shop.

• BUYS BRUSH COMPANY—Pittsburgh Plate Glass Co., has purchased the Morck Brush Mfg. Co., San Francisco, which will be operated under the company's brush division. Frank F. Tippett, formerly with the Baltimore branch of Pittsburgh Plate Glass, will manage the newly-purchased plant.

Metal Goods No Longer Lead Short Materials In Home Construction

Pittsburgh

• • • In surveys made in Chicago and Detroit, which, according to the Chicago Metropolitan Home Builders Assn., are representative of the national picture, steel mill products are no longer the most critically short materials. In the Chicago survey, it was asked what are the reasons for delays in home construction, both through shortages of materials and labor. In their order, material shortages were: Hardwood flooring, rock lath, sheet metal, plumbing fixtures, millwork, furnaces, framing lumber and soil pipe.

Other materials followed in diminishing degrees. Somewhat surprising, labor shortages have begun to be apparent, led by three trades: Lathers and plasterers, bricklayers and carpenters. Actually, lathers and plasterers appear to be the chief bottleneck in home building, and the necessity of filling in this deficiency with dry wall construction is apparent. Thus, inroads are being made into expanded metal lath and wire lath markets by reason of the shortage of help.

At Detroit a report of 25 materials in short supply was made. Metal products ranked as follows: (1) Plumbing materials, (5) nails, (9) soil pipe, (11) electrical materials, (13) warm air furnaces, (16) hardware, and (18) sheet steel. Other building materials, such as flooring, shingles, plaster, etc., filled in the gaps.

Analyses of the materials and the production of each were made on a monthly basis. Some materials that constituted a threat a few months ago, such as brick and framing lumber, appear now to be getting their stride and will shortly meet market demands. Those that still threaten home completion are hardwood flooring, plumbing materials, doors, millwork, nails, furnaces, and pipe.

Greater fear is held for skilled labor shortage than for material shortages, since it is believed by the association that by May 1947, materials will be in ample supply and labor shortages will hold up home construction.

Construction Steel...

• • • **Fabricated steel awards** this week included the following:

2500 Tons, Garrison Dam, N. D., construction bridge for U. S. Government, to Bethlehem Steel Co., Bethlehem, Pa.

1500 Tons, Schenectady, $20 million turbine building for General Electric Co. through Stone & Webster Engineering Corp., Boston.

1185 Tons, Beloit, Wis., building for Fairbanks, Morse & Co., to Cunningham Bros.

900 Tons, Pocatello, Idaho, Naval Ordnance Dept. stowage units, to Schmitt Steel Co., Portland, Ore.

835 Tons, Chicago, Warehouse, Sprague Warner Co., to J. T. Ryerson & Son, Inc., Chicago.

450 Tons, Lawrence, Mass., manufacturing plant to Bethlehem Steel Co., Bethlehem, Pa.

450 Tons, Buffalo, addition to Millard Fillmore Hospital, to Bethlehem Steel Co., Bethlehem, Pa., through Metzger Construction Corp.

400 Tons, Northumberland County, Pa., bridge, to Phoenix Bridge Co., Phoenixville, Pa.

340 Tons, Tuckahoe Creek, Md., bridge, Tidewater Construction Co., low bidder.

235 Tons, Imperial Co., Calif., two highway bridges, California Div. of Highways, Los Angeles, to Bethlehem Pacific Coast Steel Corp.

200 Tons, Michigan City, Ind., factory building to American Bridge Co., Pittsburgh.

145 Tons, Chicago, grade separation, to M. J. McDermott Co.

140 Tons, Portland, Arthur St. overcrossing, through Marine Contractors, Inc., to Schmitt Steel Co., Portland, Ore.

125 Tons, Bridgeport, Pa., building for Sharples Co., to Cantley Co.

120 Tons, Carbon County, Pa., bridge, Pennsylvania State Highway Dept., to Bethlehem Steel Co., Bethlehem, Pa.

100 Tons, Philadelphia, synagogue, to Bethlehem Fabricators Co., Bethlehem, Pa.

100 Tons, Chicago, crane runway for Cuneo Press, to Wendnagle & Co., Chicago.

• • • **Fabricated steel inquiries** this week included the following:

6500 Tons, Kansas City, building for Sunshine Biscuit Co.

4500 Tons, Sunbury, Pa., transmission equipment, Pennsylvania Power & Light Co.

4000 Tons, Ontario, Canada, transmission towers, Canadian Hydroelectric Power Commission.

2600 Tons, Eugene, Ore., relocation work, Southern Pacific R.R.

1820 Tons, Lexington, Ky., transmission tower, Kentucky Utilities Co., Inc.

1200 Tons, Kokomo, Ind., rolling mill for Haynes Stellite Co.

500 Tons, Springfield, Ill., bulk plant for Pillsbury Flour Co.

400 Tons, Baton Rouge, La., building for Solvay Process Co.

350 Tons, St. Louis, scale frame for Eagle Iron Works.

300 Tons, Whiting, Ind., compressor unit, Standard Oil Co. of Indiana.

300 Tons, Carneys Point, N. J., E. I. du Pont de Nemours Co., building, bids in.

200 Tons, Kurtz, N. D., highway underpass.

200 Tons, Chicago, storage plant, Pure Oil Co.

125 Tons, Philadelphia, auto sales and service building for Ross & Fleisher Co., bids in Oct. 30.

100 Tons, Cudahy, Wis., basins, George J. Meyer, contractor.

• • • **Reinforcing bar awards** this week included the folowing:

200 Tons, Decatur, Ala., for plant of Wolverine Tube Div., Calumet & Hecla Consolidated Copper Co., to Virginia Steel Co., Birmingham.

• • • **Reinforcing bar inquiries** this week included the following:

495 Tons, Fort Collins, Col., miscellaneous reinforcing bars, Bureau of Reclamation, Denver, Inv. F-46, 279-A, bids open Nov. 5.

Higgins Co. May Build 10,000 Steel Prefabs

Washington

• • • **Marking a probable** third venture into the guaranteed market for prefabricated houses for veterans, Expeditor Wilson W. Wyatt has announced that NHA is considering a guaranteed market contract with Andrew J. Higgins, New Orleans shipbuilder.

The contract under negotiation would call for the Higgins firm to produce basic materials for 10,000 houses. Existing contracts with two other firms will provide 29,000 prefab houses.

NHA has already approved the basic Higgins material which is a panel made of two sheets of 18-gage carbon steel, faced on both sides with a mat-surfaced vitrified enamel. The sheets would be made into walls, partitions. ceilings, etc., at the plant and assembled on the housing site.

Proposals by the Higgins firm differ from those of the first two contractors receiving guaranteed prefab contracts in that the shipbuilding firm proposes only to fabricate the panel units for the walls, partitions and ceilings together with floor tile, window frames and varied incidentals. Roofs, floors, doors, trim, plumbing, heating, and other items are not included in the Higgins package which will be priced at about $2400.

If the Higgins contract is completed, production will begin in 1947.

Portsmouth Steel Sales Reach $7.5 Million

Portsmouth, Ohio

• • • **Portsmouth Steel Corp.** reported net income of $417,850 for the three months ended Sept. 30. Net is after all charges and taxes, including $257,788 for depreciation and $317,000 for federal income taxes, and is equal to 31¢ a share. Net sales for the 3-month period totaled $7,526,978.

E. A. Schwartz, Portsmouth president, in his first report to shareholders, said steel production at Portsmouth has averaged 50,735 tons a month during the three months.

Finished and semifinished steel, wire, fence, coke and other products shipped amounted to $1,923,987 in July; $2,635,418 in August; and $2,942,200 in September. The outlook for sales of these products in the last quarter of 1946 appears favorable for continued progress, according to Mr. Schwartz' report.

"The distribution of these sales in September was approximately 28 pct to Wheeling Steel Corp., 21 pct to Kaiser-Frazer Corp. and Graham Paige Motors Corp., pursuant to our long-term contracts with these customers, and 51 pct to other customers."

Portsmouth Steel Corp. acquired the Portsmouth Works from Wheeling Steel Corp. on July 1, and began operations on that date.

GAINING MOMENTUM: *Aluminum sheeting is used for surfacing and steel for supports in this pilot model of a factory built house by Butler Mfg. Co., Kansas City. Washington sources indicate that* 100,000 *prefabs will be built using aluminum next year.*

MACHINE TOOLS

. . . News and Market Activities

WAA's New Pricing Program Causes Furore

• • • **The sound and** the fury which has continued unabated following War Assets Administrator Robert M. Littlejohn's announcement of a new pricing program which removed 60 to 70 pct of all government-owned machine tools from Clayton formula regulation and issuance of the "long supply" list, is ample evidence that the issue still enjoys top priority rating in the unhappy events department of some segments of the industry, and as a source of acrimonious inspiration, is second only to renegotiation.

While the move had been rumored for weeks, WAA's manner of breaking the news officially left a good deal to be desired from the industry's point of view. While the National Machine Tool Builders' Assn. which is represented on the Metalworking Equipment Industry Advisory Committee, was meeting in Quebec, the new pricing program was released to the press, and when the conferees at Quebec returned, the axe had fallen.

The "long supply" list, a very unpleasant adjunct as far as some machine tool builders are concerned, is a curious anomaly. Machines which have been virtually unobtainable for months in surplus appear on the list, much to the consternation of many who have sought to buy them. Also, the list is vague, giving the impression in some cases that all tools of a certain builder are in long supply when in fact only certain models which were required in considerable numbers for war production are readily available.

Now, according to reports, War Assets Administrator Littlejohn will shortly sever his connection with the agency, along with some of the higher echelon personnel. Should this prove to be the case, the rate of labor turnover in topside personnel in WAA will be about the highest in the country, a fact which is confusing but not amusing to many segments of the machine tool industry.

While it is too early to determine the full effect of WAA new, reduced prices, which amount to roughly 40 pct of Clayton formula, the long-range dope, according to the experts, is that it will tend to break the present prices of new machine tools, if they are not broken for other reasons.

Another point is that many machine tool customers will buy these machines in preference to new models, and thus take themselves out of the machine tool market for the next 10 to 15 yr.

It also seems likely that issuance of the long supply list will affect sales of new equipment by the companies that appear on the list, by providing room for doubt in some customers' minds as to whether the new machines are worth the difference.

It is the avowed and stated goal of WAA to dispose of the bulk of surplus government-owned machine tools during the next few months. This, which is considered an impossibility by most observers in the industry, will mean that WAA will have to sell very many more machine tools than the industry in that period in order to achieve its objective.

In Cincinnati, the order patterns show relatively no change since last week with moderate bookings. In some cases, backlogs are being reduced faster than bookings are being made, but the only real check on quicker production is the lag in obtaining materials to finish machines now on the schedule. Under present circumstances, production is at capacity.

In Cleveland business was generally reported as spotty. New orders are lagging to some extent, and at the same time, the offering of $4,986,000 worth of machine tools used in Cleveland Defense plants during the war at the Fisher Bomber Plant, drew customers.

In Boston, machine tool sales in October were larger than September and in fact, better than any reported in the last 4 or 5 months. Sales embraced a wide variety of tools, with lathes holding the edge. Buyers are leaning more and more to the high cost labor saving equipment. This apparent right-about-face in business is gratifying to the trade, but many sources take the conservative view of conditions and are now being swept off their back feet with the notion of a definite turn in business.

Ex Clayton Tools To Be Sold Soon

Washington

• • • War Assets Administration has issued instructions to the field that all machine tools recently removed from under the Clayton pricing formula and placed on a fixed price basis must be advertised for sale by not later than Nov. 15, it is learned here. Also, it has been ordered that all over-age (manufactured prior to 1921), special purpose, and any other tools considered suitable only for salvage must be offered under competitive bidding by Dec. 1. Purchasers of the latter will not be required to certify that they will scrap the property although at least half of the present inventory of this class, about $40 million worth, is considered suitable only for scrapping.

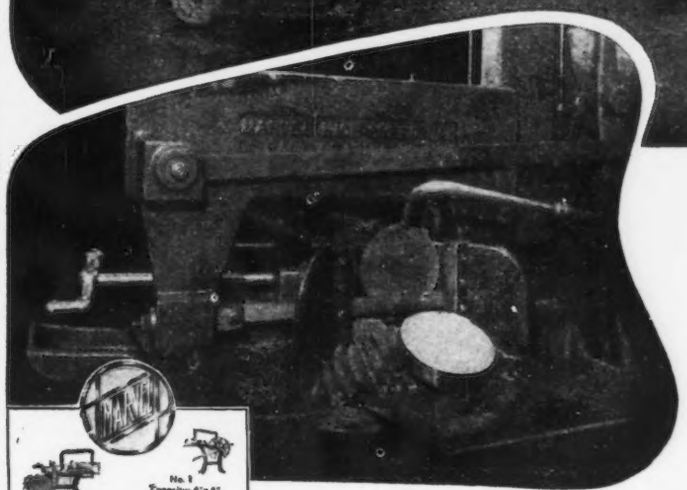
New Pricing Method

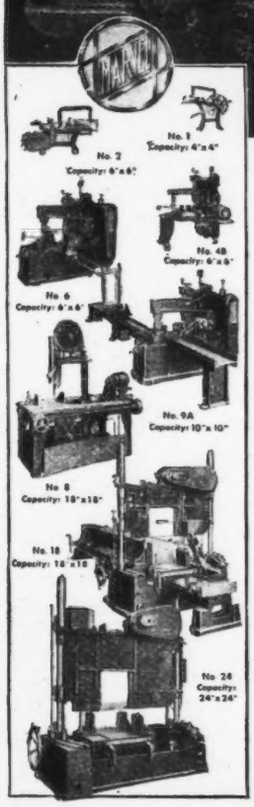
Washington

• • • **A new method of** establishing maximum prices for brand name machine tools which are not manufactured by the seller has been announced by OPA.

Effective Nov. 2, sellers who have been unable to fix ceiling prices because the manufacturers have never issued list prices, may establish ceiling prices at the total of net invoiced costs plus their Mar. 31, 1946, mark-up.

Proposed mark-ups must be submitted to OPA for approval. If the agency has taken no action within 15 days, the mark-up and maximum price may be considered approved.





No "waiting" cost here!

There are no costly delays, no men and machines standing idle, waiting for stock to be cut off from bars, when the stockroom is equipped with a No. 6A or 9A MARVEL High Speed Sawing Machine.

These *fast*, all-ball-bearing high speed saws will cut off accurate lengths or slices at almost unbelievable speed. Equipped with an automatic bar push up, they will cut identical pieces from single or nested bars automatically, with no more operator attention than an automatic screw machine. Still, at any point, the automatic operation can be interrupted, a miscellaneous cut made, and the "production" run resumed by simply re-engaging the bar feed. A single MARVEL Automatic can keep well ahead of a large machine shop, increasing the earning time on all machines.

There is a MARVEL Saw for every need—in every capacity range and price class. Your local MARVEL Sawing Engineer will gladly study your metal sawing problems and requirements and make recommendations as to methods and equipment.

Send for Catalog

ARMSTRONG-BLUM MFG. CO.

"The Hack Saw People"

5700 Bloomingdale Ave. **Chicago 39, U. S. A.**

***Eastern Sales Office:* 225 Lafayette St., New York 12, N. Y.**

MARVEL SAWS

NONFERROUS METALS

. . . News and Market Activities

U. S. Will Release Zinc To Meet Urgent Needs

Washington

• • • **Beginning in** November, all six grades of zinc will be released from government stocks as a means of supplying manufacturers who need the metal to continue operations, CPA has announced. This action was permitted by the settlement of strikes which for the past two months had cut off refinery supplies of five grades and had left only High Grade zinc available.

CPA reported current government zinc stocks approximately as follows:

Type	Net Tons	Use
Special High Grade	3,000	Die casting and electroplating
High Grade	140,000	Brass mill products
Intermediate Brass Mill Special	21,000	Brass mill and zinc rolled products
Select Prime Western	45,000	Galvanizing
	209,000	

Supplies will be available only when consumers are in urgent need of zinc. Manufacturers will be required to apply to CPA's Tin-Lead-Zinc Branch for approval of applications to buy zinc from the Office of Metals Reserve.

•

Authorize Tin in Babbitt

Washington

• • • **Virtually all** restrictions have been removed on the use of tin in the production of babbitt in bearings in order to provide a substitute for critically short lead and antimony, CPA has announced.

Effective Oct. 25, the order (Amend 1, M-43) also permits unlimited tin content in the manufacture, repair, maintenance, or replacement of multivane crosshead linings in locomotives or for lining aluminum crossheads. Up to 90 pct tin may be used for bearing purposes.

Babbitt manufacturers whose pig tin quotas are not sufficient to meet production may apply for an increase in quota. Applications for the fourth quarter must be filed not later than Nov. 30.

•

Revise Lead Order

Washington

• • • **Under revisions** of the lead order (M-38), effective Oct. 25, CPA has announced that no authorizations for use of lead will be issued during the fourth quarter to manufacturers who have not previously been engaged in storage battery manufacture.

Other provisions of the amended order are as follows:

(1) Producers of civilian-type ammunition are restricted to 89 pct of the amount used during the third quarter, (2) prohibition of shipment of new batteries except to purchasers who certify that they are to be used for new equipment.

•

Raise Lead, Copper Output

Toronto

• • • **Steadily expanding** demand for copper and lead in domestic and world markets is bringing heavier pressure on Canadian mines to increase production, and recently one or two leading producers have been stepping up operations. But labor shortage is affecting all Canadian mining operations.

Consolidated Mining & Smelting Co. has obtained contracts from the British Ministry of Supply and the U. S. Government for large quantities of lead at a price of 9.85¢ per lb.

It is said that the low ceilings on base metals are at the expense of shareholders of the producing companies. The policy is providing cheap metals to domestic consumers, some of whom are buying in excess of requirements for future use or accumulating for speculation by reselling in export markets. Examples of the wide spread between Canada's domestic prices for base metals and those prevailing in export markets are as follows:

Cents Per Pound, Carload Lots

	Electrolytic Copper	Lead	Electrolytic Zinc
Canadian ceilings	11.50	5.00	5.75
U. S. ceilings	14.375	8.25	9.69
U. S. export price	17.50	10.25	10.50
U. S. govt. price	15.10	9.88	9.13

Canadian prices are for delivery at Toronto or Montreal.

•

Magnesium

New York

• • • **The largest** producer of extruded magnesium sticks has increased the price to 36.00¢ per lb, f.o.b. Velasco, Tex. in quantities of 100 lb to 4999 lb. This price covers sticks 1.3 in. in diameter and lengths of 12 in. and 24 in. Extruded sticks were formerly sold in carload lots at 27.50¢ per lb.

During the war magnesium sticks were sold in large quantities to producers of magnesium powders for incendiary use. Since the end of the war this market for magnesium sticks disappeared and the consumers of the product for metallurgical purposes buy in much smaller volume. The cost of production has increased significantly for this reason.

•

Issue Zinc Quarterly

London

• • • **The Zinc Development Assn.** in cooperation with the Zinc Alloy Die Casters Assn. and the Zinc Pigment Development Assn. has begun the publication of a quarterly *Zinc Bulletin*. The paper is to deal with the uses of zinc and will include technical articles and data sheets. Copies may be obtained without charge from the Zinc Development Assn., Lincoln House, Turl St., Oxford, England.

Nonferrous Metals Prices

Cents per pound

	Oct. 23	Oct. 24	Oct. 25	Oct. 26	Oct. 28	Oct. 29
Copper, electro., Conn.	14.375	14.375	14.375	14.375	14.375	14.375
Copper, Lake, Conn.	14.375	14.375	14.375	14.375	14.375	14.375
Tin, Straits, New York	52.00	52.00	52.00	....	52.00	52.00
Zinc, East St. Louis	9.25	9.25	9.25	9.25	9.25	9.25
Lead, St. Louis	8.10	8.10	8.10	8.10	8.10	8.10

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, f.o.b. shipping point (min. 10,000 lb)	15.00
Aluminum pig, f.o.b. shipping point	14.00
Antimony, American, Laredo, Tex.	14.50
Beryllium copper, 3.75-4.25% Be; dollars per lb contained Be	$14.75
Beryllium aluminum, 5% Be; dollars per lb contained Be	$30.00
Cadmium, del'd	$1.25
Cobalt, 97-99% (per lb)	$1.50 to $1.57
Copper, electro, Conn. Valley	14.375
Copper, electro, New York	14.125
Copper, lake, Conn. Valley	14.375
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$ 2.25
Iridium, dollars per troy oz.	$125.00
Lead, St. Louis	8.10
Lead, New York	8.25
Magnesium, 99.8 + %, carlots	20.50
Magnesium, sticks, carlots	26.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$96 to $98
Nickel, electro, f.o.b. refinery	35.00
Palladium, dollars per troy oz.	$24 00
Platinum, dollars per troy oz.	$69 to $72
Silver, New York, cents per oz.	90.125
Tin, Straits, New York	52.00
Zinc, East St. Louis	9.25
Zinc, New York	9.69
Zirconium copper, 6 pct Zr, per lb contained Zr	$ 6.00

Remelted Metals

(Cents per lb)

Aluminum, No. 12 Fdy. (No. 2)	14.25
Piston alloys, No. 122	14.50 to 14.75
AXS 679	14.75
Aluminum, deoxidizing No. 4	13.00 to 13.50
Brass Ingot—ceiling prices	
85-5-5-5 (No. 115)	15.75
88-10-2 (No. 215)	19.00
80-10-10 (No. 305)	18.50
No. 1 Yellow (No. 405)	12.75

Copper, Copper Base Alloys

(Mill base, cents per lb)

	Extruded shapes	Rods	Sheets
Copper	25.66	....	25.81
Copper, H.R.	....	22.16	....
Copper drawn	....	23.16	....
Low brass, 80%	....	24.35	24.66
High brass	....	....	23.67
Red brass, 85%	....	24.67	24.98
Naval brass	23.84	22.59	28.53
Brass, free cut	....	18.53	....
Commercial, bronze	....	25.50	25.81
Manganese bronze	27.45	25.95	32.03
Phosphor bronze, A, B, 5%	....	43.70	43.45
Muntz metal	23.59	22.34	26.78
Everdur, Herculoy, Olympic or equal	....	29.82	30.88
Nickel silver, 5%	....	34.44	32.38
Architectural bronze	22.50	....	....

Aluminum

(Cents per lb, base, subject to extras for quantity, gage, size, temper and finish)

Drawn tubing: 2 to 3 in. OD by 0.065 in. wall: 3S, 43.5¢, 52S-O, 67¢ 24S-T, 71¢: base, 30,000 lb.

Plate: ¼ in. and heavier: 2S, 3S, 21.2¢; 52S, 24.2¢; 61S, 23.3¢; 24S, 24S-AL, 24.2¢; 75S, 75S-AL, 30.5¢; base, 30,000 lb and over.

Flat Sheet: 0.136-in. thickness: 2S, 3S, 23.7¢; 52S, 27.3¢; 61S, 24.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 32.7¢; base, 30,000 lb and over.

Extruded Solid Shapes: factor determined by dividing the perimeter of the shape by its weight per foot. For factor 1 through 4, 3S, 26¢; 14S, 32.5¢; 24S, 35¢; 53S, 61S, 28¢; 63S, 27¢; 75S, 45.5¢; base, 30,000 lb.

Wire, Rod and Bar: screw machine stock, rounds, 17S-T, ¼ in., 29.5¢; ½ in., 27.5¢; 1 in., 26¢; 2 in., 24.5¢; hexagons, ¼ in., 35.5¢; ½ in., 30¢ 1 in., 2 in., 27¢; base, 5000 lb. *Rod:* 2S, 3S, 1¼ to 2½ in. diam, rolled, 23¢; cold-finished, 23.5¢ base, 30,000 lb. *Round Wire:* drawn, coiled, B & S gage 17-18: 2S, 3S, 33.5¢; 56S, 39.5¢; 10,000 lb base; B & S gage 00-1: 2S, 3S, 21¢; 56S, 30.5¢; B & S 15-16: 2S, 3S, 32.5¢; 56S, 38¢; base, 30,000 lb.

(Continued, See Next Column)

Magnesium

Sheet, rod, tubes, bars, extruded shapes subject to individual quotations. Metal turnings: 100 lb or more, 46¢ a lb; 25 to 90 lb, 56¢; less than 25 lb, 66¢.

NONFERROUS SCRAP METAL QUOTATIONS

†(OPA basic maximum prices, cents per lb., f.o.b. point of shipment, subject to quality, quantity and special preparation premiums—other prices are current quotations)

Copper, Copper Base Alloys

OPA Group 1†

No. 1 wire, No. 1 heavy copper	11.50
No. 1 tinned copper wire, No. 1 tinned heavy copper	11.50
No. 2 wire, mixed heavy copper	10.50
Copper tuyeres	10.50
Light copper	9.50
Copper borings, No. 1	11.50
No. 2 copper borings	10.50
Lead covered copper wire, cable	....*
Lead covered telephone, power cable	7.54
Insulated copper	....*

OPA Group 2†

Bell metal	17.25
High grade bronze gears	15.00
High grade bronze solids	....*
Low lead bronze borings	....*
Babbitt lined brass bushings	14.75
High lead bronze solids	....*
High lead bronze borings	....*
Red trolley wheels	12.50
Tinny (phosphor bronze) borings	12.25
Tinny (phosphor bronze) solids	12.25
Copper-nickel solids and borings	11.00
Bronze paper mill wire cloth	11.25
Aluminum bronze solids	10.75
Soft red brass (No. 1 composition)	10.75
Soft red brass borings (No. 1)	10.75*
Gilding metal turnings	10.25
Contaminated gilded metal solids	10.25
Unlined standard red car boxes	10.00
Lined standard red car boxes	9.50
Cocks and faucets	9.50
Mixed brass screens	9.50
Red brass breakage	9.25
Old nickel silver solids	7.60
Old nickel silver borings	7.50
Copper lead solids, borings	6.75
Yellow brass castings	7.50
Automobile radiators	8.75
Zincy bronze solids, borings	9.75

OPA Group 3†

Fired rifle shells	9.50
Brass pipe	8.75
Old rolled brass	8.25
Admiralty condenser tubes	8.50
Muntz metal condenser tubes	8.00
Plated brass sheet, pipe reflectors	7.50
Manganese bronze solids	7.65[1]
Manganese bronze solids	6.65[2]
Manganese bronze borings	6.90

OPA Group 4†

Refinery brass	6.00*

*Price varies with analysis. [1] Lead content 0.00 to 0.40 pct. [2] Lead content 0.41 to 1.00 pct.

Brass Mill Scrap†

Briquetted cartridge brass turnings	10.375
Cartridge brass turnings, loose	9.625
Loose yellow brass trimmings	9.625

Aluminum

Plant scrap, segregated

2S solids	11.00 to 11.50
Dural alloys, solids 14, 17, 18, 24S, 25S	8.50 to 9.00
turnings, dry basis	7.50 to 8.00
Low copper, alloys 51, 52, 61, 63S solids	9.50 to 10.00
turnings, dry basis	8.50 to 9.00

Plant scrap, mixed

Solids	8.50 to 9.00
Turnings, dry basis	7.50

Obsolete scrap

Old sheet and utensils	9.50
Old castings and forgings	8.50 to 9.00
Pistons, free of struts	8.50

Magnesium*

Segregated plant scrap

Pure solids and all other solids	8¢
Borings and turnings	1.50

Mixed, contaminated plant scrap

Grade 1 solids	3.00
Grade 1 borings and turnings	2.00
Grade 2 solids	2.00
Grade 2 borings and turnings	1.00

*Nominal.

Zinc†

New zinc clippings, trimmings	8.00
Engravers, lithographers plates	8.00
Old zinc scrap	6.50
Unsweated zinc dross	6.55
Die cast slab	6.55
New die cast scrap	5.70
Forming and stamping dies	5.70
Radiator grilles, old and new	5.70
Old die cast scrap	5.25

Lead

Deduct 1.40¢ a lb from refined metal basing point prices for refinery charge on used battery plates.

Soft lead scrap	7.50

Nickel

Ni content 98+%, Cu under ½%, 23¢ per lb; 90 to 98% Ni, 23¢ per lb contained Ni.

ELECTROPLATING ANODES AND CHEMICALS

Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer	29.75
Electrodeposited	23.47
Rolled, oval, straight, delivered	23.72
Curved, 18 in. or longer, delivered	23.72
Brass, 80-20, frt allowed	
Cast, oval, 15 in. or longer	27.25
Zinc, cast, 99.99	17½
Nickel, 99 pct plus, frt allowed	
Cast	47
Rolled, depolarized	48
Silver, 999 fine	
Rolled, 1000 oz lots, per oz.	93⅞

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 1-5 bbls	34.00
Copper sulphate, 99.5, crystals, bbls	7.75
Nickel salts, single, 425 lb bbl, frt allowed	13.50
Silver cyanide, 100 oz lots, per oz.	0.749
Sodium cyanide, 96 pct, domestic, 125 lb drums	15.00
Zinc cyanide, 100 lb drums	33.00
Zinc sulphate, 89 pct, crystals, bbls, frt allowed	6.35

SCRAP

. . . News and Market Activities

Shipments Hold Firm at Low Level

New York

• • • **Despite a bad case** of chronic indigestion which dealers and brokers diagnose as the result of an overdose of governmental medicine, the scrap industry is continuing to furnish most of the nation's steel mills with enough raw material to keep them alive. Eastern Pennsylvania continues to show the most acute suffering from the shortage; but no single district is particularly healthy.

CPA inventory restrictions hit only a few mills which had better than a 45-day inventory on hand, proving conclusively that most mill stockpiles are considerably below their normal level for this time of the year. And scrap is still costing more than published prices indicate due to long hauls, cross hauls and premium payments. Witness one shipment to the Chicago area last week of 5000 tons from the state of Washington.

•

PITTSBURGH—Scrap movement into the district is definitely far short of needs. In only a few instances are inventories at the OPA 45-day maximum level. In the case of one company, some of its plants have OPA maximum supplies, but other plants are short and scrap is still moving into the plants that are deficient. There is a definite tendency toward overgrading, according to observers here, with even unprepared showing up as low phos. Trade gossip has it that attempts are being made in some quarters to barter scrap in return for finished steel shipments, but this is hearsay and no actual instances are known. Cross hauling is still prevalent, with a considerable amount of scrap coming into Pittsburgh from the East Coast.

•

CHICAGO—Opinion here is that CPA inventory limitations on the mills are not significant as with one or two exceptions, the mills would be more than happy if they could just build up their inventory to a 45-day supply. The 80,000 tons of Navy scrap purchased by an East Chicago dealer represents a 4-yr collection at Pearl Harbor. Distribution has not yet been arranged but it will probably not come into this area because of high freight and handling charges. There are those who say local consumers are desperate enough to pay any springboard for decent scrap, the recent 5000 tons shipped in from the state of Washington, being a case in point. However, the Pearl Harbor scrap is reported to be slated for either Columbia, Bethlehem or Kaiser on the West Coast.

PHILADELPHIA—Some observers here are of the opinion that scrap movement has fallen below last week's volume. Mills are still urgently seeking scrap although most mills in this district have received authorizations for the purchase of low-phos at the $2.50 premium. There are reports of many mechanisms for circumventing price and control regulations. In fact, the only grades said to be moving are low-phos, cast and turnings. Only the latter is not a premium grade.

•

DETROIT—There is little change in the volume of scrap moving in Detroit this week. The recent reduction of Chrysler schedules has cut into the available supply of automotive scrap and this has had the effect of increasing the pessimism of those who are predicting an exceedingly tight situation until price ceilings are lifted. One prediction heard this week was that when restrictions are lifted the price of heavy melting at Detroit might easily rise to $30 per ton and then fall within 4 months to a level lower than the present price. The threat of a coal strike has helped to check hoarding tendencies but dealers are not overlooking the possible effect on the scrap situation of a long labor tieup should Chrysler, Packard and Studebaker wage negotiations develop into a work stoppage.

•

NEW YORK—Neither dealers nor brokers here have noted any particular effects of the CPA inventory control regulations except some shipments have been ordered diverted from a few steel mills which have 45-day inventories on hand. There is still no noticeable improvement in cast scrap but steelmaking grades are moving at a better rate. Volume is not high enough to cause loud cheers but predictions of dire and utter distress for steelmakers this winter are no longer heard.

•

BOSTON—Yardsmen generally do not take CPA's inventory control too seriously. They are more concerned in when OPA will take price ceilings off. Currently, shipments are largely turnings, bundling and low-phos materials, in many cases on an upgraded basis. Peddlers are having a field day in cast. They drive up to a hungry foundry, dump the cast, get spot cash and nobody is price wiser. They have offered brokers lots at ceilings provided extra cash settlement is made on the side. Brokers have not fallen for such offers.

•

CLEVELAND—While scrap shipment dipped downward slightly last week, most consumers maintained operations status quo. Some sources feel that a spell of bad weather will curtail the movement of scrap and thus bring on the long-rumored reduction of steel making operations. As matters stand now, most consumers will probably be able to hold operations at present levels at least until the first of the year, and probably well beyond that. Warren and Youngstown consumers are operating on less margin than consumers here, but operations are being maintained. There is very little "free" scrap in the market, most of it is being sold on agreement or allocation. Over-grading continues, and while buyers are becoming a little more particular, very little if any scrap is being rejected.

•

BUFFALO—The cast scrap famine in this section has reached the point where some foundries are soliciting peddlers for direct sales in lots of any size or description and many melters are reported to have less than 10-days supply on hand. Steel mills are making no progress in building up reserves, either. With mill stock piles averaging less than 30-days' requirements and yards operating on a day to day basis, Government restrictions on holdings are regarded here as a "poor joke."

•

CINCINNATI—There is some easing in the scrap situation during this week in the local area, as the result of which blast furnace output has been increased. Reports from furnace interests indicate easing of the tension and a slightly improved flow of material. Dealers and brokers indicate a moderation in the tension but the situation is still far from being satisfactory.

•

ST. LOUIS—It is now the policy more than ever for holders of scrap iron to keep on holding it, with the feeling that OPA controls will be lifted shortly. Dealers are said to be fortified financially to keep their scrap indefinitely. Railroad offerings are light. Rills are said to have a 30-day supply and current receipts of one large company are estimated at 30 pct of actual consumption.

•

BIRMINGHAM—Despite pleas from Alabama farm leaders that increased scrap supplies will insure increased production of farm machinery, very little agricultural scrap is being received here. Consumers are hopeful, however, that an improvement will be noted when harvests are in. The little material being offered currently is from railroads and industrial plants.

•

TORONTO—While some improvement was noted in scrap iron and steel receipts during the past week or 10 days there has been comparatively little easing in the supply situation as a whole. Although most of the incoming scrap was light materials for baling, dealers reported better tonnages of heavy melting steel. However, most of this material is shipped against contract to the steel mills who are in urgent need of scrap and have been scouring the country for additional supplies to carry them through the winter months. Some scrap from rural districts has started to appear, but dealers do not look for any large tonnages from this source. Only minor tonnages of iron scrap are appearing on the market and dealers continue to report serious shortages of cast scrap and stove plate.

PITTSBURGH

Per gross ton delivered to consumer: Cast grade f.o.b. shipping point

No. 1 hvy. melting	$20.00*
RR. hvy. melting	21.00*
No. 2 hvy. melting	20.00*
RR. scrap rails	21.50*
Rails 3 ft. and under	23.50*
No. 1 comp'd sheets	20.00*
Hand bdld. new shts.	20.00*
Hvy. axle turn.	19.50*
Hvy. steel forge turn.	19.50*
Mach. shop turn.	15.00*
Short shov. turn.	17.00*
Mixed bor. and turn.	15.00*
Cast iron borings	16.00*
No. 1 cupola cast.	25.00*
Charging box cast.	21.00*
Heavy breakable cast.	20.00*
Burnt cast.	17.75*
Malleable	24.00*
RR. knuck. and coup.	24.50*
RR. coil springs	24.50*
Rail leaf springs	24.50*
Rolled steel wheels	24.50*
Low phos.	22.50*

CHICAGO

Per gross ton delivered to consumer: Cast grades f.o.b. shipping point

No. 1 hvy. melting	$18.75*
No. 2 hvy. melting	18 75*
No. 1 bundles	18.75*
No. 2 dealers' bndls.	18.75*
Bundled mach. shop turn.	18.75*
Galv. bundles	16.75*
Mach. shop turn.	13.75*
Short shovels, turn.	15.75*
Cast iron borings	14.75*
Mix. borings & turn.	13.75*
Low phos. hvy. forge	23.75*
Low phos. plates	21.25*
No. 1 RR. hvy. melt.	19.75*
Reroll rails	22.25*
Miscellaneous rails	20.25*
Angles & splice bars	22.25*
Locomotive tires, cut	24.25*
Cut bolsters & side frames	22.25*
Standard stl. car axles	25.75*
No. 3 steel wheels	23.25*
Couplers & knuckles	23.25*
Malleable	24.00*
No. 1 mach. cast.	20.00*
Rails 3 ft. and under	22.25*
No. 1 agricul. cast.	20.00*
Hvy. breakable cast.	20.00*
RR. grate bars	15 25*
Cast iron brake shoes	17.75*
Stove plate	23.00*
Clean auto cast.	27.00*
Cast iron carwheels	22.00*

CINCINNATI

Per gross ton delivered to consumer: Cast grades f.o.b. shipping point

No. 1 hvy. melting	$19.50*
No. 2 hvy. melting	19.50*
No. 1 bundles	19.50*
No. 2 bundles	19.50*
Mach. shop turn.	$10.50 to 11.00
Shoveling turn.	12.50 to 13.00
Cast iron borings	11.50 to 12.00
Mixed bor. & turn.	11.50 to 12.00
Low phos. plate	22.00*
No. 1 cupola cast.	25.00*
Hvy. breakable cast.	20.00*
Stove plate	23.00*
Scrap rails	21.00*

BOSTON

Dealers' buying prices per gross ton, f.o.b. cars

No. 1 hvy. melting	$15.05*
No. 2 hvy. melting	15.05*
Nos. 1 and 2 bundles	15.05*
Busheling	15.05*
Turnings, shovelings	12.05*
Machine shop turn.	10.05*
Mixed bor. & turn.	10.05*
Cl'n cast, chem. bor.	$13.06 to 14.15*
No. 1 machinery cast.	25.00*
No. 2 machinery cast.	21.00*
Breakable cast.	20.00*
Stove plate	23.00*

DETROIT

Per gross ton, brokers' buying prices:

No. 1 hvy. melting	$17.32*
No. 2 hvy. melting	17.32*
No. 1 bundles	17.32*
New busheling	17.32*
Flashings	17.32*
Mach. shop turn.	12.32*
Short shov. turn.	14.32*

Going prices as obtained in the trade by IRON AGE editors, based on representative tonnages. Where asterisks are used they indicate the OPA ceiling price to which must be added brokerage fee and adjusted freight.

Cast iron borings	13.32*
Mixed bor. & turn.	12.32*
Low phos. plate	19.82*
No. 1 cupola cast.	25.00*
Charging box cast.	21.00*
Hvy. breakable cast.	20.00*
Stove plate	23.00*
Automotive cast.	27.00*

PHILADELPHIA

Per gross ton delivered to consumer: Cast grades f.o.b. shipping point

No. 1 hvy. melting	$18.75*
No. 2 hvy. melting	18.75*
No. 2 bundles	18.75*
Mach. shop turn.	13.75*
Shoveling turn.	15.75*
Cast iron borings	14.75*
Mixed bor. & turn.	13.75*
No. 1 cupola cast.	25.00*
Hvy. breakable cast.	20.00*
Cast. charging box	21.00*
Clean auto cast.	27.00*
Hvy. axle forge turn.	18.25*
Low phos. plate	21.25*
Low phos. punchings	21.25*
RR. steel wheels	23.25*
RR. coil springs	23.25*
RR. malleable	22.00*

ST. LOUIS

Per gross ton delivered to consumer: Cast grades f.o.b. shipping point

No. 1 heavy melting	$17.50*
Bundled sheets	17.50*
Mach. shop turn.	12.50*
Locomotive tires, uncut	21.00*
Misc. std. sec. rails	19.00*
Rerolling rails	21.00*
Steel angle bars	21.00*
Rails 3 ft and under	21.50*
RR. springs	22.00*
Steel car axles	24.50*
Stove plate	23.00*
Grate bars	15.25*
Brake shoes	17.75*
Malleable	24.00*
Cast iron carwheels	22.00*
No. 1 mach'ery cast.	22 00*
Breakable cast.	20.00*

BIRMINGHAM

Per gross ton delivered to consumer: Cast grades f.o.b. shipping point

No. 1 hvy. melting	$17.00*
No. 2 hvy. melting	17.00*
No. 2 bundles	17.00*
No. 1 busheling	17.00*
Long turnings	12.00*
Shoveling turnings	14.00*
Cast iron borings	13.00*
Bar crops and plate	$18.50 to 19.50*
Structural and plate	18.50 to 19.50*
No. 1 cast.	25.00*
Stove plate	23.00*
Steel axles	18.50*
Scrap rails	18.50
Rerolling rails	20.50*
Angles & splice bars	20.50 to 21.00
Rails 3 ft. & under	21.00*
Cast iron carwheels	22.00*

YOUNGSTOWN

Per gross ton delivered to consumer: Cast grades f.o.b. shipping point

No. 1 hvy. melting	$20.00*
No. 2 hvy. melting	20.00*
Low phos. plate	22.50*
No. 1 busheling	20.00*
Hydraulic bundles	20.00*
Mach. shop turn.	15.00*
Short shovel. turn.	17.00*
Cast iron borings	16.00*

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$15.33*
No. 2 hvy. melting	15.33*
Comp. black bundles	15.33*
Comp. galv. bundles	13.33*
Mach. shop turn.	10.33*
Mixed bor. & turn.	10.33*
Shoveling turn.	12.33*
No. 1 cupola cast.	25.00*
Hvy. breakable cast.	20.00*
Charging box cast.	21.00*
Stove plate	23.00*
Clean auto cast.	27.00*
Unstrip. motor blks.	20.00*
Cl'n chem. cast bor.	14.33*

BUFFALO

Per gross ton delivered to consumer: Cast grades f.o.b. shipping point

No. 1 hvy. melting	$19.25*
No. 1 bundles	19.25*
No. 2 bundles	19.25*
No. 2 hvy. melting	19.25*
Mach. shop turn.	14.25*
Shoveling turn.	16.25*
Cast iron borings	15.25*
Mixed bor. & turn.	14.25*
No. 1 cupola cast.	25.00*
Charging box cast.	21.00*
Stove plate	23.00*
Clean auto cast.	27.00*
Malleable	24.00*
Low phos. plate	21.75*
Scrap rails	20.75*
Rails 3 ft. & under	22.75*
RR. steel wheels	23.75*
Cast iron carwheels	22.00*
RR. coil & leaf spgs.	23.75*
RR. knuckles & coup.	23.75*
No. 1 busheling	19.25*

CLEVELAND

Per gross ton delivered to consumer: Cast grades f.o.b. shipping point

No. 1 hvy. melting	$19.50*
No. 2 hvy. melting	19.50*
Compressed sheet stl.	19.50*
Drop forge flashings	19.00
No. 2 bundles	19.50*
Mach. shop turn.	14.50*
Short shovel.	16.50*
No. 1 busheling	19.50*
Steel axle turn.	19.00*
Cast iron borings	15.50*
Mixed bor. & turn.	14.50*
No. 2 busheling	17.00*
No. 1 machinery cast.	25.00*
Malleable	24.00*
Railroad cast	20.00*
Railroad grate bars	15 25*
Stove plate	23.00*
RR. hvy. melting	20.50*
Rails 3 ft. & under	23.00*
Rails 18 in. & under	24.25*
Rails for rerolling	23.00*
Elec. furnace punch	22.00*

SAN FRANCISCO

Per gross ton delivered to consumer: Cast grade f.o.b. shipping point

No. 1 hvy. melting	$17.00*
No. 2 hvy. melting	17.00*
No. 2 bales	17.00*
No. 3 bales	15.00*
Mach. shop turn.	12.00*
Elec. furn. 1 ft. und.	19.50*
No. 1 cupola cast.	25.00*
RR. hvy. melting	18.00*

LOS ANGELES

Per gross ton delivered to consumer: Cast grade f.o.b. shipping point

No. 1 hvy. melting	$17.00
No. 2 hvy. melting	17.00
No. 1 bales	17.00
No. 2 bales	17.00
No. 3 bales	15.00
Mach. shop turn.	12.00
No. 1 cupola cast.	25.00

SEATTLE

Per gross ton delivered to consumer: Cast grade f.o.b. shipping point

No. 1 & No. 2 hvy. melting	$14.50*
Elec. furn. 1 ft. und.	17.00
No. 1 cupola cast.	25.00*
RR. hvy. melting	14.50*

HAMILTON, ONT.

Per gross ton delivered to consumer: Cast grades f.o.b. shipping point

Heavy melting	$17.50*
No. 1 bundles	17.50*
No. 2 bundles	17.00*
Mixed steel scrap	15.50*
Rails, remelting	18.50*
Rails, rerolling	21.50*
Bushelings	13.00*
Mixed borings & turnings	12.50*
Electric furnace bundles	20.50*
Manganese steel scrap	20.00*
No. 1 cast	19.00*
Stove plate	17.50*
Car wheels, cast	19.50*
Malleable iron	16.00*

Comparison of Prices . .

[Advances over past week in **Heavy Type**, declines in *Italics*. Prices are f.o.b. major basing points. The various basing points for finished and semifinished steel are listed in the detailed price tables.]

(cents per pound)	Oct. 29, 1946	Oct. 22, 1946	Sept. 24, 1946	Oct. 30, 1945
Hot-rolled sheets	2.425	2.425	2.425	2.20
Cold-rolled sheets	3.275	3.275	3.275	3.05
Galvanized sheets (24 ga.)	4.05	4.05	4.05	3.70
Hot-rolled strip				
6-in and under	2.45	2.45	2.45	2.10
Over 6 in.	2.35	2.35	2.35	2.10
Cold-rolled strip	3.05	3.05	3.05	2.80
Plates	2.50	2.50	2.50	2.25
Plates, wrought iron	4.112	4.112	4.112	3.80
Stain's c-r strip (No. 302)	30.30	30.30	30.30	28.00
Tin and Ternplate: (dollars per base box)				
Tinplate, standard cokes..	$5.00	$5.00	$5.00	$5.00
Tinplate, electro (0.50 lb)	4.50	4.50	4.50	4.50
Special coated mfg. ternes	4.30	4.30	4.30	4.30
Bars and Shapes: (cents per pound)				
Merchant bars	2.50	2.50	2.50	2.25
Cold-finished bars	3.10	3.10	3.10	2.75
Alloy bars	2.92	2.92	2.92	2.70
Structural shapes	2.35	2.35	2.35	2.10
Stainless bars (No. 302).	25.97	25.97	25.97	24.00
Wrought iron bars	4.76	4.76	4.76	4.40
Wire and Wire Products: (cents per pound)				
Bright wire	3.05	3.05	3.05	2.75
Wire nails	3.75	3.75	3.75	2.90
Rails: (dollars per net ton)				
Heavy rails	$43.39	$43.39	$43.39	$43.00*
Light rails	49.18	49.18	49.18	45.00*
*per gross ton				
Semifinished Steel: (dollars per gross ton)				
Rerolling billets	$39.00	$39.00	$39.00	$36.00
Sheet bars	38.00	38.00	38.00	36.00
Slabs, rerolling	39.00	39.00	39.00	36.00
Forging billets	47.00	47.00	47.00	42.00
Alloy blooms, billets, slabs	58.43	58.43	58.43	54.00
Wire Rods and Skelp: (cents per pound)				
Wire rods	2.30	2.30	2.30	2.15
Skelp	2.05	2.05	2.05	1.90

(per gross ton)	Oct. 29, 1946	Oct. 22, 1946	Sept. 24, 1946	Oct. 30, 1945
No. 2 foundry, Phila.	$30.43	$30.43	$30.43	$27.59
No. 2, Valley furnace	28.50	28.50	28.50	25.75
No. 2, Southern, Cin'ti	27.80	27.80	27.80	26.19
No. 2, Birmingham	24.88	24.88	24.88	22.13
No. 2 foundry, Chicago†	28.50	28.50	28.50	25.75
Basic, del'd eastern Pa.	29.93	29.93	29.93	27.09
Basic, Valley furnace	28.00	28.00	28.00	25.25
Malleable, Chicago†	28.50	28.50	28.50	25.75
Malleable Valley	28.50	28.50	28.50	25.75
L. S. charcoal, Chicago	42.34	42.34	42.34	42.34
Ferromanganese‡	135.00	135.00	135.00	135.00

† The switching charge for delivery to foundries in the Chicago district is 60¢ per ton.
‡ For carlots at seaboard.
* Prices retroactive to May 29; the price increase should be reflected in THE IRON AGE Comparison of Prices table since June 4.

Scrap: (per gross ton)				
Heavy melt'g steel, P'gh.	$20.00	$20.00	$20.00	$20.00
Heavy melt'g steel, Phila.	18.75	18.75	18.75	18.75
Heavy melt'g steel, Ch'go	18.75	18.75	18.75	18.75
No. 1 hy. comp. sheet, Det.	17.32	17.32	17.32	17.32
Low phos. plate, Youngs'n	22.50	22.50	22.50	22.50
No. 1 cast, Pittsburgh	25.00	25.00	25.00	20.00
No. 1 cast, Philadelphia	25.00	25.00	25.00	20.00
No. 1 cast, Chicago	25.00	25.00	25.00	20.00
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$8.75	$8.75	$8.75	$7.50
Foundry coke, prompt	8.50	8.50	8.50	9.00
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro., Conn.	14.375	14.375	14.375	12.00
Copper, Lake, Conn.	14.375	14.375	14.375	12.00
Tin, Straits, New York	52.00	52.00	52.00	52.00
Zinc, East St. Louis	9.25	9.25	8.25	8.25
Lead, St. Louis	8.10	8.10	8.10	6.35
Aluminum, virgin	15.00	15.00	15.00	15.00
Nickel, electrolytic	35.00	35.00	35.00	35.00
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	14.50	14.50	14.50	14.50

Composite Prices . .

[Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942 and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite prices for the current quarter are an estimate based on finished steel shipments for the previous quarter. These figures will be revised when the actual data of shipments for this quarter are compiled.]

	FINISHED STEEL	PIG IRON	SCRAP STEEL
Oct. 29, 1946	2.73011¢ per lb.	$28.13 per gross ton.	$19.17 per gross ton.
One week ago	2.73011¢ per lb.	$28.13 per gross ton.	$19.17 per gross ton.
One month ago	2.73011¢ per lb.	$28.13 per gross ton.	$19.17 per gross ton.
One year ago	2.44104¢ per lb.	$25.37 per gross ton.	$19.17 per gross ton.

	FINISHED STEEL HIGH	FINISHED STEEL LOW	PIG IRON HIGH	PIG IRON LOW	SCRAP STEEL HIGH	SCRAP STEEL LOW
1946	2.73011¢ July 4	2.54490¢ Jan. 1	$28.13 May 29	$25.37 Jan. 1	$19.17	$19.17
1945	2.44104¢ Oct. 2	2.38444¢ Jan. 2	25.37 Oct. 23	23.61 Jan. 2	$19.17 Jan. 2	$18.92 May 22
1944	2.30837¢ Sept. 5	2.21189¢ Oct. 5	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.29176¢	2.29176¢	23.61	23.61	$19.17	$19.17
1942	2.28249¢	2.28249¢	23.61	23.61	19.17	19.17
1941	2.43078¢	2.43078¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1934	2.15367¢ Apr. 24	1.95757¢ Jan. 2	17.90 May 1	16.90 Jan. 27	13.00 Mar. 13	9.50 Sept. 25
1933	1.95578¢ Oct. 3	1.75836¢ May 2	16.90 Dec. 5	13.56 Jan. 3	12.25 Aug. 8	6.75 Jan. 3
1932	1.89196¢ July 5	1.83901¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1931	1.99626¢ Jan. 13	1.86586¢ Dec. 29	15.90 Jan. 6	14.79 Dec. 15	11.33 Jan. 6	8.50 Dec. 29
1930	2.25488¢ Jan. 7	1.97319¢ Dec. 9	18.21 Jan. 7	15.90 Dec. 16	15.00 Feb. 18	11.25 Dec. 9
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 3

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 78 pct of the United States output. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia, and Chicago.

GLOBE STEEL TUBES

what's your need in SIZE?

Globe seamless steel tubing is made hot finished and cold drawn in alloy and carbon steels in sizes from ½ inch to 6⅝ inches outside diameter.

Globe seamless stainless steel tubing is available in tube sizes from ½ inch to 6⅝ inches outside diameter and in pipe sizes ⅛ inch to 6 inches, standard, extra strong and double extra strong weights.

Gloweld (electric welded) stainless steel tubing may be had in sizes ranging from ⅜ inch to 4 inches outside diameter inclusive, and in standard weight pipe sizes ⅛ inch to 2 inches, inclusive.

Your tubing needs may lie somewhere within the above ranges — whatever your requirements, Globe is qualified by experience and facilities to supply you with tubing of the quality and uniformity you demand.

GLOBE STEEL TUBES COMPANY, Milwaukee 4, Wisconsin

GLOBE TUBES

★ STAINLESS STEEL TUBES ★ PRESSURE TUBES ★ GLOBEIRON TUBING ★ GLOWELD TUBES
★ CONDENSER AND HEAT EXCHANGER TUBES ★ MECHANICAL TUBING

5025

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. basing points, in cents per pound or dollars per gross ton. Extras apply. Delivered prices do not reflect 3 pct tax on freight. (1) Mill run sheet, 10¢ per 100 lb under base; primes, 25¢ above base. (2) Unassorted commercial coating. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Applies to certain width and length limitations. (6) For merchant trade. (7) For straight length material only from producer to consumer. Discount of 25¢ per 100 lb to fabricators. (8) Also shafting. For quantities of 20,000 lb to 39,999 lb. (9) Carload lot in manufacturing trade. (10) Prices do not apply if rail and water is not used. (11) Boxed. (12) This base price for annealed, bright finish wires, commercial spring wire. (13) Produced to dimensional tolerances in AISI Manual Sect. 6. (14) Billets only. (15) 9/32 in. to 47/64 in., 0.15¢ per lb higher.

Basing Points	Pitts-burgh	Chicago	Gary	Cleve-land	Birm-ingham	Buffalo	Youngs-town	Spar-rows Point	Granite City	Middle-town, Ohio	Gulf Ports, Cars	10 Pacific Ports, Cars	DELIVERED TO Detroit	New York	Phila-delphia
INGOTS Carbon, rerolling	($33.00 f. o. b. mill)														
Carbon, forging	$38	$38	$38	$38	$38	$38	$38								
Alloy	$48.69	$48.69				$48.69	(Bethlehem, Massillon, Canton, Coatesville=$48.69)								
BILLETS, BLOOMS, SLABS Carbon, rerolling	$39	$39	$39	$39	$39	(Provo=$50.20, Duluth=$41[14]) $39	$39	$39				$51.50[14]	$41.50		
Carbon, forging billets	$47	$47	$47	$47	$47	(Provo=$58.20, Duluth=$49[14]) $47	$47					$59.50[14]	$49.50		
Alloy	$58.43	$58.43				$58.43	(Bethlehem, Massillon, Canton=$58.43)						$60.93		
SHEET BARS	$38	$38		$38		$38	$38	$38	(Canton=$38)						
PIPE SKELP	2.05¢	2.05¢					2.05¢	2.05¢	(Coatesville=2.05¢)						
WIRE RODS[15] No. 5 to 9/32 in.	2.30¢	2.30¢		2.30¢	2.30¢		(Worcester=2.40¢)				2.585¢	2.835¢			
SHEETS Hot-rolled	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.875¢	2.425¢		3.01¢	2.56¢	2.685¢	2.615¢
Cold-rolled[1]	3.275¢	3.275¢	3.275¢	3.275¢		3.275¢	3.275¢		3.375¢	3.275¢		3.96¢	3.41¢	3.635¢	3.635¢
Galvanized (24 gage)	4.05¢	4.05¢	4.05¢		4.05¢	4.05¢	4.05¢	4.05¢	4.50¢	4.05¢		4.635¢		4.31¢	4.24¢
Enameling (20 gage)	3.80¢	3.80¢	3.80¢	3.80¢			3.80¢		3.90¢	3.80¢		4.485¢	3.935¢	4.20¢	4.16¢
Enameling (10 Gage)	3.20¢	3.20¢	3.20¢	3.20¢			3.20¢		3.30¢	3.20¢		3.885¢	3.335¢	3.60¢	3.56¢
Long ternes[2]	4.05¢	4.05¢	4.05¢									4.835¢		4.45¢	4.41¢
STRIP Hot-rolled[3] 6 in. and under	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢		2.45¢			2.45¢		3.135¢	2.585¢	2.85¢	2.81¢
Hot-rolled[3] over 6 in.	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢		2.35¢			2.35¢		3.035¢	2.485¢	2.75¢	2.71¢
Cold-rolled[4]	3.05¢	3.15¢		3.05¢			3.05¢	(Worcester=3.25¢)					3.185¢	3.45¢	3.41¢
Cooperage stock	2.55¢	2.55¢			2.55¢		2.55¢							2.95¢	
TINPLATE Standard cokes, base box	$5.00	$5.00	$5.00		$5.10			$5.10	$5.10					$5.375	$5.301
Electro, box 0.25 lb	$4.35	$4.35	$4.35					$4.35							
Electro, box 0.50 lb	$4.50	$4.50	$4.50					$4.60	$4.60						
Electro, box 0.75 lb	$4.65		$4.65					$4.75	$4.75						
BLACKPLATE 29 gage[5]	3.30¢	3.30¢	3.30¢					3.40¢	3.40¢					3.67¢	3.59¢
TERNES, MFG. Special coated, base box	$4.30	$4.30	$4.30					$4.40	$4.40						
BARS Carbon steel	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	(Duluth=2.60¢) (Provo, Utah=3.20¢)			2.885¢	3.185¢	2.635¢	2.84¢	2.86¢
Rail steel[6]	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢					2.885¢	3.185¢			
Reinforcing (billet)[7]	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢			2.735¢	2.785¢	2.485¢	2.61¢	2.69¢
Reinforcing (rail)[7]	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢				2.735¢	2.785¢	2.485¢		
Cold-finished[8]	3.10¢	3.10¢	3.10¢	3.10¢		3.10¢	(Detroit=3.15¢) (Toledo=3.25¢)							3.44¢	3.46¢
Alloy, hot-rolled	2.92¢	2.92¢				2.92¢	2.92¢	(Bethlehem, Massillon, Canton=2.92¢)					3.055¢		
Alloy, cold-drawn	3.62¢	3.62¢	3.62¢	3.62¢		3.62¢							3.765¢		
PLATE Carbon steel[13]	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢		2.50¢	(Coatesville, Claymont=2.50¢ Geneva Utah=2.65¢) 2.50¢			2.885¢	3.085¢	2.755¢	2.71¢	2.558¢
Floor plates	3.75¢	3.75¢									4.135¢	4.435¢		4.15¢	4.15¢
Alloy	3.79¢	3.79¢			(Coatesville=3.79¢)						4.305¢	4.525¢		4.01¢	3.895¢
SHAPES Structural	2.35¢	2.35¢	2.35¢		2.35¢	2.35¢	(Bethlehem=2.35¢)				2.735¢	3.035¢		2.54¢	2.48¢
SPRING STEEL, C-R 0.26 to 0.50 carbon	3.05¢			3.05¢			(Worcester=3.25¢)								
0.51 to 0.75 carbon	4.65¢			4.65¢			(Worcester=4.85¢)								
0.76 to 1.00 carbon	6.65¢			6.65¢			(Worcester=6.85¢)								
1.01 to 1.25 carbon	9.03¢			9.03¢			(Worcester=9.23¢)								
WIRE[9] Bright[12]	3.05¢	3.05¢		3.05¢	3.05¢		(Worcester=3.15¢) (Duluth=3.10¢)					3.585¢		3.44¢	3.41¢
Galvanized	Add proper size extra and galvanizing extra to Bright Wire Base														
Spring (high carbon)	4.00¢	4.00¢		4.00¢			(Worcester=4.10¢) (Trenton=4.25¢)					4.535¢		4.39¢	4.339¢
PILING Steel sheet	2.65¢	2.65¢				2.65¢						3.235¢		2.99¢	3.01¢

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

BASING POINT	Chromium Nickel		Straight Chromium			
	No. 304	No. 302	No. 410	No. 430	No. 442	No. 446
Ingot, P'gh, Chi, Canton, Balt, Reading, Ft. Wayne, Phila.	Subject to negotiation			Subject to negotiation		
Blooms, P'gh, Chi, Canton, Phila, Reading, Ft. Wayne, Balt.	22.99	24.67	17.01	17.47	20.69	25.29
Slabs, P'gh, Chi, Canton, Balt, Phila, Reading	22.99	24.67	17.01	17.47	20.69	25.29
Billets P'gh, Chi, Canton, Watervliet, Syracuse, Balt.	Subject to negotiation			Subject to negotiation		
Billets, forging, P'gh Chi, Canton, Dunkirk, Balt, Phila, Reading, Watervliet, Syracuse, Ft. Wayne, Titusville	22.99	24.67	17.01	17.47	20.69	25.29
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville	27.05	25.97	20.02	20.56	24.34	29.75
Bars, c-f, P'gh, Chi, Cleve, Canton, Dunkirk, Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet	27.05	25.97	20.02	20.56	24.34	29.75
Plates, P'gh, Middletown, Canton	31.38	29.21	23.28	23.80	28.67	33.00
Shapes, structural, P'gh, Chi	27.05	25.97	20.02	20.56	24.34	29.75
Sheets, P'gh, Chi, Middletown, Canton, Balt.	38.95	36.79	28.67	31.38	35.16	38.49
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown	25.43	23.28	18.39	18.93	25.97	37.87
Strip, c-r, P'gh, Cleve, Newark, N. J., Reading, Canton, Youngstown	32.46	30.30	23.80	24.34	34.62	56.26
Wire, c-d, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila.	27.05	25.97	20.02	20.56	24.34	29.75
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton	32.46	30.30	23.80	24.34	34.62	56.26
Rod, h-r, Syracuse	27.05	25.97	20.02	20.56	24.34	29.75
Tubing, seamless, P'gh, Chi, Canton, (4 in. to 8 in.)	72.09	72.09	.....	68.49	.....	.....

TOOL STEEL

*(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. *Also Canton, O.)*

An increase of 8.2 pct applies to base price and extras

	Base per lb
High speed	67¢
Straight molybdenum	54¢
Tungsten-molybdenum	57½¢
High-carbon-chromium*	43¢
Oil hardening*	24¢
Special carbon*	22¢
Extra carbon*	18¢
Regular carbon*	14¢

Warehouse prices on and east of Mississippi are 2¢ per lb higher; west of Mississippi 3¢ higher.

ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	per lb
Field grade	3.90¢
Armature	4.25¢
Electrical	4.75¢
Motor	5.425¢
Dynamo	6.125¢
Transformer 72	6.625¢
Transformer 65	7.625¢
Transformer 58	8.125¢
Transformer 52	8.925¢

F.o.b. Chicago and Gary, field grade through motor; f.o.b. Granite City, add 10¢ per 100 lb on field grade to and including dynamo. Pacific ports add 75¢ per 100 lb on all grades.

RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, heavier than 60 lb	
No. 1 O.H., net ton	$43.39
Angle splice bars, 100 lb	2.85
(F.o.b. basing points)	per net ton
Light rails (from billets)	$49.18
Light rails (from rail steel)	49.18
	base per lb
Cut spikes	3.65¢
Screw spikes	*5.15¢
Tie plate, steel	2.55¢
Tie plates, Pacific Coast	2.70¢
Track bolts	6.50¢
Track bolts, heat treated, to railroads	6.75¢
Track bolts, jobbers discount	63-5

*Plus 12 pct.

Basing points, light rails, Pittsburgh, Chicago, Birmingham; cut spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo. Cut spikes alone—Youngstown, Lebanon, Pa., Richmond, Oregon and Washington ports, add 25¢.

ROOFING TERNEPLATE

(F.o.b. Pittsburgh, 112 sheets)

	20x14 in.	20x28 in.
8-lb coating I.C.	$8.50	$17.00
15-lb coating I.C.	9.50	19.00
20-lb coating I.C.	10.00	20.00

CLAD STEEL

Base prices, cents per pound

	Plate	Sheet
Stainless-clad		
No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Pa.	21.00*	22.00
Nickel-clad		
10 pct, f.o.b. Coatesville, Pa.	18.72	....
Inconel-clad		
10 pct, f.o.b. Coatesville	26.00	....
Monel-clad		
10 pct, f.o.b. Coatesville	24.96	....
Aluminized steel		
Hot dip, 20 gage, f.o.b. Pittsburgh	....	9.00

*Includes annealing and pickling.

WIRE PRODUCTS

To the dealer, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham, Duluth

	Basing Points Named	Pacific Coast Basing Points†
	base per keg	
Standard wire nails	$3.75	$4.25
Coated nails	3.75	4.25
Cut nails, carloads	4.85	....
	base per 100 lb	
Annealed fence wire	$3.50	$4.00
Annealed galv. fence wire	3.85	4.35
	base column	
Woven wire fence*	72	90
Fence posts, carloads	74	91
Single loop bale ties††	72	97
Galvanized barbed wire**	79	89
Twisted barbless wire	79	89

*15½ gage and heavier. **On 80-rod spools in carload quantities.

†Prices subject to switching or transportation charges.

††Add 50c a ton.

HIGH TENSILE, LOW ALLOY STEELS

base prices, cents per pound

Steel	Aldecor	Corten	Double Strength No. 1	Dynalloy	HI Steel	Mayari R	Otis-coloy	Yoloy	Y-50
Producer	Republic	Carnegie-Illinois, Republic	Republic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	American Rolling Mill
Plates	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	.....
Sheets									
Hot-rolled	3.575	3.575	3.575	3.575	3.575	3.575	3.575	3.575	.....
Cold-rolled	4.525	4.525	4.525	.....	4.525	4.525	4.525	4.525	5.225*
Galvanized	.....	.....	.....	.....	.....	5.50	.....	.....	.....
Strip									
Hot-rolled									
Over 6-in.	3.60	3.60	3.60	.....	3.60	3.60	3.60	3.60	.....
6-in & under	3.70	3.70	3.70	.....	3.70	3.70	3.70	3.70	.....
Cold-rolled	4.30	.....	4.30	.....	4.40	.....	4.30	4.30	5.00*
Commodity	.....	.....	.....	.....	.....	.....	4.45	.....	.....
Shapes	.....	3.45	.....	.....	3.45	3.45	3.45	3.45	.....
Beams	.....	3.45	.....	.....	.....	3.45	.....	.....	.....
Bars									
Hot-rolled	3.70	3.70	3.70	.....	.....	3.70	3.70	3.732†‡	.....
Cold rolled	.....	.....	.....	.....	.....	.....	.....	4.382†‡	.....
Bar shapes	.....	3.85	.....	.....	3.85	3.85	3.85	3.85	.....
Billets, blooms, slabs (per gross ton)									
Structural	.....	.....	.....	.....	.....	.....	.....	$74.65†	.....
Forging	.....	.....	.....	.....	.....	.....	.....	$82.23†	.....

* 21 gage and lighter. † Alloy extras apply. ‡ Add 0.379¢ for forging or heat treating grade.

WELDED PIPE AND TUBING

Base discounts, f.o.b. Pittsburgh district and Lorain, Ohio, mills

(F.o.b. Pittsburgh only on wrought pipe)
Base price—$200.00 per net ton

Steel (buttweld)

	Black	Galv.
½-in.	60½	48
¾-in.	63½	52
1-in. to 3-in.	65½	54½

Wrought Iron (buttweld)

½-in.	17⅞	+4⅜
¾-in.	24¼	2⅝
1-in. and 1¼-in.	28⅝	9⅛
1½-in.	33	11⅞
2-in.	32⅝	11⅜

Steel (lapweld)

2-in.	58	46½
2½-in. and 3-in.	61	49½
3½-in. to 6-in.	63	51½

Wrought Iron (lapweld)

2-in.	24⅞	4⅞
2½-in. to 3½-in.	25⅞	7½
4-in.	28⅛	11⅝
4½-in. to 8-in.	27	10¼

Steel (butt, extra strong, plain ends)

½-in.	58½	47½
¾-in.	62½	51½
1-in. to 3-in.	64	54

Wrought Iron (same as above)

½-in.	18⅞	+1⅝
¾-in.	25⅝	4¾
1-in. to 2-in.	33	13

Steel (lap, extra strong, plain ends)

2-in.	56	45½
2½-in. and 3-in.	60	49½
3½-in. to 6-in.	63½	53

Wrought Iron (same as above)

2-in.	28½	8⅝
2½-in. to 4-in.	34	16¼
4½-in. to 6-in.	32⅝	14⅝

On buttweld and lapweld steel pipe jobbers are granted a discount of 5 pct. On l.c.l. shipments prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or $4 a ton higher than Pittsburgh or Lorain on lapweld and one point lower discount, or $2 a ton higher on all buttweld.

BOILER TUBES

Seamless steel and lapweld commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft f.o.b. Pittsburgh, in carload lots

	Seamless Cold-Drawn	Seamless Hot-Rolled	Lap-weld, Hot-Rolled
2 in. O.D. 13 B.W.G.	16.52	13.90	13.20
2½ in. O.D. 12 B.W.G.	22.21	18.70	17.67
3 in. O.D. 12 B.W.G.	24.71	20.79	19.56
3½ in. O.D. 11 B.W.G.	31.18	26.25	24.68
4 in. O.D. 10 B.W.G.	38.68	32.56	30.55

(Extras for less carload quantities)

40,000 lb or ft and over.....Base
30,000 lb or ft to 39,999 lb or ft.... 5 pct
20,000 lb or ft to 29,999 lb or ft.... 10 pct
10,000 lb or ft to 19,999 lb or ft.... 20 pct
5,000 lb or ft to 9,999 lb or ft.... 30 pct
2,000 lb or ft to 4,999 lb or ft.... 45 pct
Under 2,000 lb or ft.....65 pct

CAST IRON WATER PIPE

Per net ton

6-in. to 24-in., del'd Chicago.....$70.33
6-in. to 24-in., del'd New York.... 69.60
6-in. to 24-in., Birmingham..... 61.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles or Seattle for all rail shipment; rail and water shipment less 84.40

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

BOLTS, NUTS, RIVETS, SET SCREWS

An increase of 12 pct applies to listings except Large Rivets

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts

Base discount less case lots

Percent Off List

½ in. & smaller x 6 in. & shorter...65½
9/16 & ⅝ in. x 6 in. & shorter.....63½
¾ to 1 in. x 6 in. & shorter.....61
1⅛ in. and larger, all lengths.....59
All diameters over 6 in. long.....59
Lag, all sizes 62
Plow bolts 65

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

½ in. and smaller 62
9/16 to 1 in. inclusive.....59
1⅛ to 1½ in. inclusive.....57
1⅝ in. and larger 56

On above bolts and nuts, excepting plow bolts, additional allowance of 10 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifin. Hexagon Nuts	U.S.S.	S.A.E.
Base discount less keg lots		
7/16 in. and smaller	..	64
½ in. and smaller.....	62	..
½ in. through 1 in.....	..	60
9/16 in. through 1 in.....	59	..
1⅛ in. through 1½ in....	57	58
1⅝ in. and larger	56	..

In full keg lots, 10 pct additional discount. For 200 lb or more, freight allowed up to 50¢ per 100 lb, based on Cleveland, Chicago, Pittsburgh.

Stove Bolts

Consumer

Packages, nuts loose .....71 and 10
In packages 71
In bulk 80

On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.

Large Rivets
(½ in. and larger)

Base per 100 Lb

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham $4.75
F.o.b. Lebanon, Pa. 4.90

Small Rivets
(7/16 in. and smaller)

Percent Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham .....65 and 5

Cap and Set Screws *(In packages)*	*Percent Off List Consumer*
Upset full fin, hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in.	64
Upset set screws, cup and oval points	71
Milled studs	46
Flat head cap screws, listed sizes.....	36
Fillister head cap, listed sizes.....	51

Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.

FLUORSPAR

Maximum price f.o.b. consumer's plant, $30 per short ton plus either (1) rail freight from producer to consumer, or (2) rail freight from Rosiclare, Ill., to consumer, whichever is lower.

Effective CaF_2 Content:	*Base price per short ton*
70% or more $33.00	
65% but less than 70%.....	32.00
60% but less than 65%.....	31.00
Less than 60%	30.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

Per Gross Ton

Old range, bessemer $5.45
Old range, non-bessemer 5.30
Mesaba, bessemer 5.20
Mesaba, non-bessemer 5.05
High phosphorus 5.05

Prices are for ore shipped on and after June 24, 1946, and for ore covered by adjustable pricing agreements authorized by Order No. 8, RMPR 113.

These prices do not reflect the recent ICC increase in freight rates.

METAL POWDERS

Prices in cents per pound in ton lots, f.o.b. shipping point.

Brass, minus 100 mesh..19¼¢ to 21½¢
Copper, electrolytic, 100 and 375 mesh .....23½¢ to 27½¢
Copper, reduced, 150 and 200 mesh ..... 22¾¢
Iron, commercial, 100, 200, 325, mesh 96 + % Fe.....11¢ to 16¢
Swedish sponge iron, 100 mesh, c.l.f. N. Y., carlots, ocean bags....7.4¢ to 8¢
Iron, crushed, 200 mesh and finer, 90 + % Fe carload lots..... 4¢
Iron, hydrogen reduced, 300 mesh and finer, 98 + % Fe, drum lots ..... 63¢
Iron, electrolytic, unannealed, 325 mesh and coarser, 99 + % Fe.25¢ to 31¢
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe ..... 17¢
Iron carbonyl, 300 mesh and finer, 98-99.8 + % Fe .....90¢ to $1.75
Aluminum, 100, 200 mesh, carlots 25¢
Antimony, 100 mesh ..... 30¢
Cadmium, 100 mesh $1.75
Chromium, 100 mesh and finer..... $1.35
Lead, 100, 200 & 300 mesh.13¼¢ to 16¾¢
Manganese, minus 325 mesh and coarser .....44¢ to 61¢
Nickel, 150 mesh ..... 51½¢
Silicon, minus 325 mesh and coarser .....26¢ to 55¢
Solder powder, 100 mesh..31½¢ plus metal
Tin, 100 mesh ..... 58¾¢
Tungsten metal powder, 98%-99%, any quantity, per lb..... $2.60
Molybdenum powder, 99%, in 100-lb kegs, f.o.b. York, Pa., per lb.. $2.65
Under 100 lb..... $2.90

COKE

	Net Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	$8.75
Connellsville, Pa., hand drawn.	9.35
Foundry, beehive (f.o.b. oven)	
Fayette Co., W. Va.	8.10
Connellsville, Pa.	8.50
Foundry, Byproduct	
Chicago, del'd	15.10
Chicago, f.o.b.	14.35
New England, del'd	16.04
Kearny, N. J., f.o.b.	14.40
Philadelphia, del'd	14.62
Buffalo, del'd	14.75
Portsmouth, Ohio, f.o.b.	12.85
Painesville, Ohio, f.o.b.	13.50
Erie, del'd	14.50
Cleveland, del'd	14.55
Cincinnati, del'd	14.60
St. Louis, del'd	15.10†
Birmingham, del'd	12.25

†Except producers situated in states other than Missouri, Alabama or Tennessee, sellers may charge a maximum delivered price of $15.60 in the St. Louis Mo., and East St. Louis, Ill., switching districts.

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick

Carloads Per 1000

Super-duty brick, St. Louis.....$81.00
First quality, Pa., Md., Ky., Mo., Ill., Ohio 65.00
First quality, New Jersey 70.00
Sec. quality, Pa., Md., Ky., Mo., Ill. 59.00
Sec. quality, New Jesey 62.00
Sec. quality, Ohio 57.00
Ground fire clay, net ton, bulk..... 9.50

Silica Brick

Pennsylvania and Birmingham ...$65.00
Chicago District 74.00
Silica cement, net ton (Eastern)... 11.50
Chicago 12.50

Chrome Brick *Per Net Ton*

Standard chemically bonded, Balt., Plymouth Meeting, Chester $54.00

Magnesite Brick

Standard, Balt. and Chester $76.00
Chemically bonded, Baltimore 65.00

Grain Magnesite

Domestic, f.o.b. Balt. and Chester in sacks $44.50
Domestic, f.o.b. Chewelah, Wash., in bulk 22.00
in sacks 26.00
Clinker (dead burned) dolomite, bulk, per net ton, f.o.b. York, Pa. 10.05
Midwest, add 10¢; Mo. Valley, add 20¢

WAREHOUSE PRICES

Delivered metropolitan areas, per 100 lb.

Cities	SHEETS			STRIP			Plates ¼ in. and heavier	Structural Shapes	BARS		ALLOY BARS			
				Hot-Rolled										
	Hot-Rolled (10 gage)	Cold-Rolled	Galvanized (24 gage)	6 in. and Under	Over 6 in.	Cold-Rolled			Hot-Rolled	Cold-Finished	Hot-Rolled, A-8617-20	Hot-Rolled, A-8742-50 Ann.	Cold-Drawn, A-8617-20	Cold-Drawn, A-8742-50 Ann.
**Philadelphia	$3.774	$5.139	$5.249[a]	$4.314	$4.214	$5.064	$3.875	$3.937	$4.114	$4.564	$6.287	$7.387	$7.664	$8.764
New York	3.856	4.869	5.501	4.375	4.275	5.075	4.049	4.038	4.134	4.584	6.338	7.438	7.684	8.784
Boston	4.05	5.031	5.725	4.518	4.418	4.985	4.203	4.023	4.356	4.656	6.503	7.603	7.756	8.856
Baltimore	3.64	5.118	5.365	4.293	4.193	....	3.865	4.05	4.093	4.543	....	....	....	....
Norfolk	4.037	....	5.862	4.577	4.477	....	4.262	4.303	4.377	4.677	....	....	....	....
Chicago	3.475	4.425	5.40	3.95	3.85	4.90[6]	3.80	....	3.75	4.20	6.05	7.15	7.20	8.30
Milwaukee	3.633	4.583	5.558	4.108	4.008	5.058[6]	3.958	3.958	3.908	4.358	6.308	7.408	7.458	8.558
Cleveland	3.575	....	5.347	3.95	3.85	....	3.65	3.88	3.60	4.20	6.277	7.377	7.20	8.30
Buffalo	3.575	4.625	5.20	4.211	4.111	4.961	3.921	3.65	3.60	4.20	6.05	7.15	7.20	8.30
Detroit	3.71	4.76	5.526	4.085	3.985	4.95	3.935	3.987	3.735	4.285	6.456	7.556	7.585	8.685
Cincinnati	3.671	4.721	5.296	4.046	3.946	5.002	3.952	3.983	3.902	4.502	6.441	7.541	7.602	8.702
St. Louis	3.643	4.593	5.622	4.118	4.018	5.222	3.968	3.968	3.918	4.522	6.472	7.572	7.622	8.722
Pittsburgh	3.575	4.625	5.20	3.95	3.85	4.70	3.65	3.65	3.60	4.20	6.05	7.15	7.20	8.30
St. Paul	3.817	4.767	5.668	4.292	4.192	5.000	4.142	4.142	4.092	4.852	....	6.322	7.952	8.052
Duluth	3.817	4.767	5.668	4.292	4.192	....	4.142	4.142	4.092	....	6.472	6.572	....	....
Omaha	4.045	5.72	6.00	4.52	4.42	....	4.37	4.37	4.32	4.945	....	....	....	....
Indianapolis	3.775	4.825	5.40	4.15	4.05	5.03	3.92	3.92	3.87	4.47	6.17	....	7.32	....
Birmingham	3.675	....	5.20	4.05	3.95	....	3.80	3.80	3.75	4.954	6.414	7.514	7.564	8.614
Memphis	4.221	....	5.746	4.596	4.496	....	4.348	4.348	4.296	4.821	....	....	....	....
New Orleans	4.359*	5.40[1]	5.884	4.734	4.634	....	4.484	4.484*	4.434*	5.175	....	....	....	....
Los Angeles	4.885	6.635[1]	6.565	5.335	5.235	....	4.835	4.735	4.685	6.065	....	....	....	....
San Francisco	4.435	6.035	6.585	4.885	4.785	....	4.535	4.385	4.435	5.815	....	....	....	....
Seattle	4.905[5]	7.305[2]	6.435	4.635	4.535	....	5.035[5]	4.735[5]	4.635[5]	6.265	7.735[8]	8.735[8]	....	9.585[8]
Portland	4.905[4]	....	6.235	5.135	....	....	5.035[4]	4.735[4]	4.735[4]	6.015	7.735	8.885	....	....
Salt Lake City	4.81	....	6.70	5.94	5.84	....	5.29	5.29	5.19	6.48	....	....	....	....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb; strip, extras on all quantities; bars, 1500 lb base.

ALLOY BARS: 1000 to 39,999 lb.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 450 to 3749 lb; (4) 300 to 4999 lb; (5) 300 to 10,000 lb; (6) 2000 lb and over; (7) 3500 lb and over; (8) 1000 lb and over.

(a) Philadelphia: Galvanized sheet, 25 or more bundles.

Extra for size, quality, etc., apply on above quotations.

* Add 29.1¢ for sizes not rolled in Birmingham.

** City of Philadelphia only. Applicable freight rates must be added to basing point prices to obtain delivered price to other localities in metropolitan area.

PIG IRON PRICES

Per gross ton, retroactive to May 29.

BASING POINT PRICES

Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	29.00	29.50	30.00	30.50	.....
Birdsboro	29.00	29.50	30.00	30.50	34.00
Birmingham	23.50*	24.88*	.....	29.50	.....
Buffalo	27.50	28.50	29.00	29.50	34.00
Chicago	28.00	28.50	28.50	29.00	.....
Cleveland	28.00	28.50	28.50	29.00	.....
Detroit	28.00	28.50	28.50	29.00	.....
Duluth	28.50	29.00	29.00	29.50	.....
Erie	28.00	28.50	29.00	29.50	.....
Everett	29.00	29.50	30.00	30.50	.....
Granite City	28.00	28.50	28.50	29.00	.....
Hamilton	28.00	28.50	28.50	.....	.....
Neville Island	28.00	28.50	28.50	29.00	.....
Provo	28.00	28.50	.....	.....	.....
Sharpsville	28.00	28.50	28.50	29.00	.....
Sparrows Point	29.00	29.50	.....	.....	.....
Steelton	29.00	.....	.....	.....	34.00
Swedeland	29.00	29.50	30.00	30.50	.....
Toledo	28.00	28.50	28.50	29.00	.....
Youngstown[1]	28.00	28.50	28.50	29.00	.....

DELIVERED PRICES (BASE GRADES)

Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	$0.50 Arb.	29.50	30.00	30.50	31.00	.....
Boston	Birdsboro-Steelton	4.47	.....	.....	.....	.....	38.47
Brooklyn	Bethlehem	2.78	31.78	32.28	32.78	33.28	.....
Brooklyn	Birdsboro	3.26	.....	.....	.....	.....	37.26
Canton	Clev. Ygstn, Sharpsvll.	1.54	29.54	30.04	30.04	30.54	.....
Canton	Buffalo	3.55	.....	.....	.....	.....	37.55
Cincinnati	Birmingham	4.30	27.80*	29.18*	.....	.....	.....
Cincinnati	Hamilton	1.24	.....	.....	29.74	.....	.....
Cincinnati	Buffalo	4.89	.....	.....	.....	.....	38.89
Jersey City	Bethlehem	1.70	30.70	31.20	31.70	32.20	.....
Jersey City	Birdsboro	2.16	.....	.....	.....	.....	36.16
Los Angeles	Provo	5.25	31.25	31.75	.....	.....	.....
Los Angeles	Buffalo	16.33	.....	.....	.....	.....	50.33
Mansfield	Cleveland-Toledo	2.16	30.16	30.66	30.66	31.16	.....
Mansfield	Buffalo	3.74	.....	.....	.....	.....	37.74
Philadelphia	Swedeland	0.93	29.93	30.43	30.93	31.43	.....
Philadelphia	Birdsboro	1.38	.....	.....	.....	.....	35.38
San Francisco	Provo	5.25	31.25	31.75	.....	.....	.....
San Francisco	Buffalo	16.33	.....	.....	.....	.....	50.33
Seattle	Provo	5.25	31.25	31.75	.....	.....	.....
Seattle	Buffalo	16.33	.....	.....	.....	.....	50.33
St. Louis	Granite City	0.50 Arb.	28.50	29.00	29.00	29.50	.....
St. Louis	Buffalo	7.86	.....	.....	.....	.....	41.86

* Republic Steel Corp. has been granted a $2 increase on basic and foundry pig iron produced at Birmingham.

(1) Struthers Iron & Steel Co., Struthers, Ohio, may charge 50¢ per ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable.

Charcoal pig iron base prices for Lyles, Tenn., and Lake Superior furnaces, $33.00 and $34.00, respectively. Newberry Brand of Lake Superior charcoal iron $39.00 per g.t., f.o.b. furnace. Delivered to Chicago, $42.34.

High phosphorus iron sells at Lyles, Tenn., at $28.50.

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorous content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron, silicon 6.00 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—$34.00; f.o.b. Buffalo—$35.25. Add $1.00 per ton for each additional 0.50 pct Si. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for prices of comparable analysis.

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Philadelphia, New York, Birmingham, Rockdale, Rockwood, Tenn.

Carload lots (bulk)	$135.00
Less ton lots (packed)	148.50
F.o.b. Pittsburgh	139.50

$1.70 for each 1% above 82% Mn; penalty, $1.70 for each 1% below 78%.

Briquets—cents per pound of briquet, freight allowed, 66% contained Mn.

	Eastern	Central	Western
Carload, bulk	6.05	6.30	6.60
Ton lots	6.65	7.55	8.55
Less ton lots	6.80	7.80	8.80

Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Carloads	$35.00	$36.00
Less ton	47.50	48.50
F.o.b. Pittsburgh, Chicago	40.00	

Manganese Metal

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.

96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, bulk	30
L.c.l. lots	32

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	32
Ton lots	34
Less ton lots	36

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.

	Carloads	Ton	Less
0.10% max. C, 0.06% P, 90% Mn	21.00	21.40	21.65
0.10% max. C	20.50	20.90	21.15
0.15% max. C	20.00	20.40	20.65
0.30% max. C	19.50	19.90	20.15
0.50% max. C	19.00	19.40	19.65
0.75% max. C, 7.00% max. Si	16.00	16.40	16.65

Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed. 65-70% Mn, 17-20% Si, 1.5% max. C.

Carload, bulk	6.05
Ton lots	6.70
Briquet, contract basis, carlots, bulk freight allowed, per lb of briquet.	5.80
Ton lots	6.30
Less ton lots	6.55

Silvery Iron (electric furnace)

Si 14.01 to 14.50%, $51.25 f.o.b. Keokuk, Iowa; $48.00 f.o.b. Jackson, Ohio; $49.25 f.o.b. Niagara Falls. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 per ton for low impurities, not to exceed: P—0.05%, S—0.04%, C—1.00%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots, packed.

	Eastern	Central	Western
96% Si, 2% Fe	13.10	13.55	16.50
97% Si, 1% Fe	13.45	13.90	16.80

Ferrosilicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si.

	Eastern	Central	Western
Carload, bulk	3.60	3.75	3.90
Ton lots	4.15	4.55	4.60
Less ton lots	4.40	4.80	4.85

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
50% Si	7.05	7.50	7.65
75% Si	8.55	8.70	9.25
88-90% Si	9.50	9.65	10.15
90-95% Si	11.80	11.95	12.40

Ferrochrome

(65-72% *Cr*, 2% *max. Si*)

Contract prices, cents per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
0.06% C	23.00	23.40	24.00
0.10% C	22.50	22.90	23.50
0.15% C	22.00	22.40	23.00
0.20% C	21.50	21.90	22.50
0.50% C	21.00	21.40	22.00
1.00% C	20.50	20.90	21.50
2.00% C	19.50	19.90	20.50
66-71% Cr, 4-10% C	14.50	14.90	15.00
62-66% Cr, 5-7% C	15.05	15.45	15.55

Briquets—contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.

	Eastern	Central	Western
Carload, bulk	9.20	9.50	9.90
Ton lots	9.80	10.30	11.80
Less ton lots	10.10	10.60	12.10

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low-carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N. High-carbon type: 66.71% Cr, 4-5% C, 0.75% N. Add 5¢ per lb to regular high-carbon ferrochrome price schedule.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

	Eastern	Central	Western
Carload	15.60	16.00	16.10
Ton lots	16.65	17.30	18.50
Less ton lots	17.30	17.95	19.15

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

	Eastern	Central	Western
Carload	20.00	20.40	21.00
Ton lots	21.00	21.65	22.85
Less ton lots	22.00	22.65	23.85

Chromium Metal

Contract prices, cents per lb, chromium contained, carload, f.o.b. shipping point, freight allowed. 97% min. Cr, 1% max. Fe.

	Eastern	Central	Western
0.20% max. C	83.50	85.00	86.25
0.50% max. C	79.50	81.00	82.25
9.00% min. C	79.50	81.00	82.25

Chromium—Copper

Contract price, cents per pound of alloy, f.o.b. Niagara Falls, freight allowed east of the Mississippi. 8-11% Cr, 88-90% Cu, 1.00% max. Fe, 0.50% max. Si.

Shot or ingot	45¢

Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.

30-35% Ca, 60-65% Si, 3.00% max. Fe or 28-32% Ca, 60-65% Si, 6.00% max. Fe.

	Eastern	Central	Western
Carloads	13.00	13.50	15.55
Ton lots	14.50	15.25	17.40
Less ton lots	15.50	16.25	18.40

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.

16-20% Ca, 14-18% Mn, 53-59% Si.

	Eastern	Central	Western
Carloads	15.50	16.00	18.05
Ton lots	16.50	17.35	19.10
Less ton lots	17.00	17.85	19.60

Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1¢ for central zone; 5¢ for western zone.

	Cast	Turnings	Distilled
Ton lots	$1.35	$1.75	$4.25
Less ton lots	1.60	2.00	5.00

CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

	Eastern	Central	Western
Ton lots	12.00	12.75	14.75
Less ton lots	12.50	13.25	15.25

Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	11.75	12.50	14.50
Less ton lots	12.25	13.00	15.00

SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe.

	Eastern	Central	Western
Ton lots	12.00	12.85	14.60
Less ton lots	12.50	13.35	15.10

Other Ferroalloys

Ferrotungsten, standard, lump or ¼X down, packed, f.o.b. plant Niagara Falls, Washington, Pa., York, Pa., per pound contained T, 5 ton lots, freight allowed	$1.88
Ferrovanadium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.	
Openhearth	$2.70
Crucible	$2.80
High speed steel (Primos)	$2.90
Vanadium pentoxide, 88-92% V_2O_5 technical grade, contract basis, per pound contained V_2O_5	$1.10
Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb.	
Ton lots	$2.25
Less ton lots	$2.30
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo	95¢
Calcium molybdate, 40-45%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo	80¢
Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo	80¢
Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo	80¢
Ferrotitanium, 40-45%, 0.10%C max., f.o.b. Niagara Falls, N. Y., ton lots, per pound contained Ti	$1.23
Less ton lots	$1.25
Ferrotitanium, 20-25%, 0.10%C max., ton lots, per pound contained Ti	$1.35
Less ton lots	$1.40
High-carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads	$142.50
Ferrophosphorus, 18%, electric or blast furnaces, f.o.b. Anniston, Ala., carlots, with $3 unitage freight equalled with Rockdale, Tenn., per gross ton	$58.50
Ferrophosphorus, Electrolytic, 23-26%, carlots, f.o.b. Monsanto (Siglo), Tenn., $3 unitage freight equalized with Nashville, per gross ton	$75.00
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Carload lots	14¢
Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy	
Carload, bulk	4.60¢
Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Niagara Falls, carload	5.75¢
Ton lots	7.25¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Car lots	8.50¢
Ton lots	9.25¢
Less ton lots	9.75¢

Boron Agents

Contract prices per pound of alloy, f.o.b. shipping point, freight allowed. Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.

	Eastern	Central	Western
Less ton lots	$1.30	$1.3075	$1.329

Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C.

Ton lots	$1.89	$1.903	$1.935
Less ton lots	2.01	2.023	2.055

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.

Less ton lots	$2.10	$2.1125	$2.1445

Silcaz No. 3, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
carload lots	25¢
Ton lots	26¢
Silvaz No. 3, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Carload lots	58¢
Ton lots	59¢
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.	
No. 1	87.5¢
No. 6	60¢
No. 79	45¢
Bortram, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢

British Steel Board Plan To Approve Entire Modernization Plan

London

• • • **With nearly a year passed** since the British steel industry completed its postwar modernization plans, the newly appointed Iron & Steel Board has yet to hold a full-fledged meeting to put its stamp of approval on the detailed sections of the modernization plan. Although officially the steed board has absolute authority in directing what new plants may be built and where, actually the plans for a few of the basic construction programs are so far advanced that the board must accept them as being irrevocable and concern itself more primarily with future decisions.

The new government-controlled body whose functions include the general supervision of prices and allocations as well as imports and exports is fortunate in that it inherits a staff of approximately 70 full-time civil servants who were part of what was known during the war as the Ministry of Supply Iron and Steel Control, and is a thoroughly experienced group which maintains the continuity in handling day to day functions duly taken over by the steel board. The tasks for the new control board would certainly be much more difficult if they included the recruitment of an experienced organization from outside sources.

The staff has experience of peacetime operations as well as wartime, as it was in turn formed at the beginning of the war from the between wars group known as the Import Duties Advisory Committee. This group, in connection with its activities of selecting which products should bear an import duty, kept in general touch with steel policies and the activities of the British Iron & Steel Federation.

Thus with this experienced staff the members of the control board can divert most of their attention to the urgent need for action on postwar modernization plans. Due to the unfortunate series of delays prompted largely by the nationalization issue, the $672 million program is now desperately in need of acceleration. The 5-yr plan which it was originally hoped would terminate in 1950 now looks like ending not earlier than 1953. It seems likely that, if the new control board cannot expedite the work so as to arrive at all fundamental decisions and complete its basic work on modernization within the next 6 months, drastic action must be taken.

It is difficult to know exactly how much work had been done to date, as in the political struggle over nationalization conflicting stories have frequently been published, some accusing the steel industry of deliberately holding up its plans, while others assert that the work has been going forward as rapidly as possible. Projects like the new continuous strip mill in South Wales and the new wide flange beam mill on the Northeast Coast, where some amount of site work has gone on, have at least progressed sufficiently that there will be no question on the part of the board but that these projects will go forward.

Despite the fact that some uncertainty has prevailed in the first half of this year as to the future of the modernization program, the British Iron & Steel Federation has kept in close touch with the builders of steel mill machinery and equipment, and considerable space has been reserved on the books of those firms whether in the form of written contracts or otherwise.

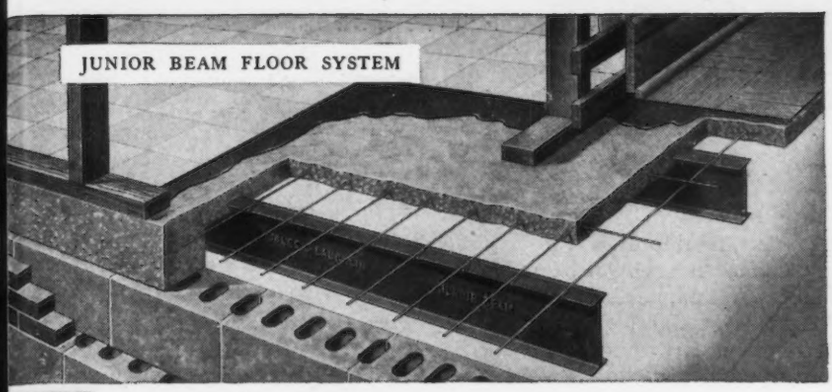
The steel board, having held one get-acquainted session is now generally foreseen as an organization that will meet approximately once a week, with occasional extra gatherings to visit specific sites. To set the modernization program into full operation, one of the first actions of the board was reported to have been a call for a detailed status report on the various projects involved. With such a report in hand the board will be able to determine where it should start in its efforts to get all the major programs under way.

Despite a general agreement that the fundamental concepts of the modernization plan as drawn up by the Federation are sound, there is an increasing feeling here that the steel board will make a careful study of the sociological factors involved in those parts of the program to which they are not already by sheer weight of events irrevocably committed.

The Federation being a body of steel men made an effort to consider the government's sociological views in drawing up the plan, but placed the emphasis on the technical considerations in determining such matters as plant allocation, rationalization and size of production units. The government-controlled board, however, will be more likely to give additional attention to the impact of the program on the cities and towns involved and modify the program where indicated.

OFF WITH A BANG: *Professor A. M. Low, left, who began his experiments with rockets in* 1917, *chats with the manager of the Wembly Speedway in England about a new rocket-assisted motorcycle. An American racing car driver has tried a similar device which, in motorcycle racing, should keep other contestants at a respectful distance.*

DRAWN FOR JONES & LAUGHLIN STEEL CORPORATION BY ORISON MACPHERSON



STEEL JUNIOR BEAMS FOR FLOORS OF YOUR NEW HOUSE CAN BE SHIPPED AT ONCE FROM J&L WAREHOUSES

A J&L steel Junior Beam floor will give strength and long life to that new house of yours at no extra cost. The steel beams for this unique floor system are waiting for you now at the nearest J&L warehouse. Junior Beam steel-and-concrete floors provide a rigid, vibration-free, shrinkproof floor system as an integral part of the house foundation. They form a firestop between the basement and the remainder of your house. Also, they prevent moisture from rising through partition walls.

With Junior Beam floors you eliminate settling caused by shrinking of wooden joists. Consequently, your beautiful plaster walls and ceilings will not be marred by unsightly cracks. Your doors and windows will not twist and stick. Junior Beam floors reduce the hazard of fire. They protect from termites, mice and other vermin.

Now is the time, in the blueprint stage of your hopes and plans, to consult your architect or builder about the fine, solid floor system provided by these exclusive J&L light structural steel members. You will appreciate them for the expense they save on upkeep. Their long life will protect your investment in your home for many years.

JONES & LAUGHLIN STEEL CORPORATION

J&L STEEL

PITTSBURGH, PENNSYLVANIA

J&L SERVICE WAREHOUSES: CHICAGO • CINCINNATI • DETROIT
PITTSBURGH • MEMPHIS • NEW ORLEANS • LONG ISLAND CITY, N.Y.*

Operated by Jones & Laughlin Steel Service, Inc.

(Advertisement)

STOUT STEEL FLOORS

Simplicity of placing Junior Beam floors is demonstrated in large illustration. Steel beams though strong are light, can be handled easily by one or two men. Wooden form is built around beams. When concrete is poured it forms solid cap over foundation of house. Small, cut-away drawing above shows Junior Beams, reinforcing rods, concrete slab and detail of partition wall that will interest your architect and builder. It also shows parquet hardwood floor laid in mastic. Provision can be made just as easily to place nailing strips in concrete to receive conventional floor. Carpets, linoleum, tile, terrazzo, composition block coverings are readily laid on this slab, too.

Steel-and-concrete floors available now. Junior Beams are being stocked in seven strategically located J&L Warehouses in New York, Chicago, Cincinnati, Detroit, Pittsburgh, Memphis and New Orleans.

Hollywood studio technique will be adopted by University of Illinois in new housing demonstration center and production yard. It will provide unlimited possibilities for experiments which cannot be done in individual homes. Complete homes or houses without roofs or with cut-away sections for study and photography can be built on the "set."

Junior Beams and Channels, exclusive Jones & Laughlin products, are structural steel sections literally "junior" to the well-known heavy structural members. Rolled on a J&L designed bar mill, they afford strength with minimum weight. Junior Beams have fiber stress of 18,000 pounds per square inch, yet 10" beam weighs only 9 lbs. per foot compared to 25.4 lbs. per foot for same size standard beam.

Ornamental stairs in many houses are fabricated from J&L Junior Channels. They give rigid support to slate, tile, marble, or terrazzo treads, risers and heavy wrought railings. Junior Channels and Jal-Tread checker floor plate provide non-skid, fireproof basement stairs.

Your recreation room will be more attractive in your Junior Beam house. The underside of the concrete slab and the beams, when painted, provide an attractive ceiling. Electrical conduit can be concealed in the slab itself. If you wish, metal lath can be clipped to underside of beams and ceiling plastered as in any other room.

Booklets available on Junior Beams and Junior Channels. Prospective owners, contractors, engineers, architects will be interested in folder "Nine Simple Steps," showing how easily Junior Beams are installed. Other booklets, "Engineering Data," "Junior Channels" and "Floors for Residences," give additional information. For copies write Publicity Manager, Jones & Laughlin Steel Corporation, Pittsburgh 30, Pa.

Money to be Made in Missouri

A parent plant or branch office in Missouri is a bid for better business. There's money to be made in Missouri . . . and here's why:

The new state constitution is modern, favorable to industry. Low taxes. Water supply unlimited. Low cost power and natural resources in abundance. Excellent transportation facilities. Wealth of diversified markets. Skilled and semi-skilled native labor available in 350 alert, cooperative communities.

During first nine months of 1946, 2,251 new businesses were incorporated in Missouri.

Specialized, confidential service to industrialists. Write direct: Missouri State Division of Resources and Development, Dept. M-62, Jefferson City, Mo.

THE STATE OF MISSOURI

In The Heart of America

Study of Pittsburgh Reveals Liability Of Heavy Duty Weight

Pittsburgh

• • • **In an elaborate** 700 page study made for the Pittsburgh Chamber of Commerce, the Pittsburgh Civic-Business Council, and the Allegheny Conference on Community Development by the Econometric Institute, Inc., New York, the long range industrial and economic outlook for the Pittsburgh industrial area has been examined. The purpose of the survey was to forecast probable levels of production, employment, and income. The forecasts take two positions (1) Based on the assumption that none of the liabilities of the area will be corrected, and (2) based on the assumption that correction of the faults will be undertaken.

The report points out the dominance of heavy industries in Pittsburgh, and, such being the case, the economics of the city are subject to violent fluctuations of business cycles. It is well located for industrial purposes, being near an inexhaustible coal supply, oil fields, three navigable rivers, and on the east-west route of a great railroad. Further, the expenditure of a relatively small sum of money could result in a canal from the Allegheny River to Lake Erie.

It indicates that the area has run down physically, being built as a place to work rather than live, and is thus suffering economically. Pittsburgh, while it will remain a great center of steel and heavy industry, will decline unless new industries employing women are brought in to the area. There should be expansion of production of consumer goods, wholesale trade and distribution, and of satellite industries using products manufactured here. The chemical industry should provide a number of these. Many of the faults of the area the report stated, are imaginary, but since they are believed they are detrimental to the area.

The existing industrial groups and areas of deficiency are catalogued, and it is shown that Pittsburgh is deficient in 15 of the 20 census classifications. Wage rates, however, are higher than in cities of comparable size. This is attributable to the type of manufacturing in the area. In other than the iron and steel industry, however, wages paid in Pittsburgh are lower than those paid elsewhere. Printing, meat packing and food products are typical of low-wage industries. The average non-manufacturing wage rate is lower than that paid by manufacturing industries. Since Pittsburgh is considered a high wage town, this has adversely influenced new investment.

Cost of living in the area is comparable with other cities except the cost of habitation, whether it be rent or amortization of ownership. The greatest problem in Pittsburgh is housing and re-housing, including the abolishment of slum areas and the re-establishment of those areas as properties with better real estate values.

As an industrial location, Pittsburgh has many attractions but industrial expansion is handicapped by such factors as smoke and air pollution, reputed high wages, and the reputation as an undesirable place. Clean up and advertising campaigns and a progressive attempt to obtain new industries are suggested correctives. As to natural resources and employment the city is in good shape, but it is suggested that increased employment opportunity through small industry providing both diversification and stability are suggested. Also, improvement of the environment is recommended.

As industry here is heavy and relatively mature, expansion is not likely. Therefore, light industry and other businesses such as distribution, commerce, etc., must be attracted to the area. A small percentage of the total population in the area is in the labor force. Women especially are not relatively well represented because of the lack of employment opportunity. The suggested new industry correctives would help this situation. While Pittsburgh has been declining in production relative to the nation, the same correctives suggested would aid this. The survey points out that labor-management relations in the area have reached a greater degree of maturity than normal, and the better relations and reputation could be had if the knowledge of these good

relations was more widespread.

As to the city plan, it is old and it is a steel town. As such it has an undesirable reputation which is now showing its economic effects. Problems of congestion, housing, and urban blight should be solved.

As to why industry leaves Pittsburgh or fails to come into the area, the reasons are many and varied. Some of them are: lack of room for expansion, floods, plants are old and remodeling expensive, inadequate warehousing, shifting markets, congestion, wage rates, and freight rates and switching charges. The survey states that many of the objections are unjustified. Promotion and advertising can correct the false impressions, and the objections with foundation must be eliminated.

Consequently, the findings of the survey boil themselves down into three major classifications: (1) Slum clearance, rehousing and city cleanup. (2) Attract new and more diversified industry into the city. (3) Squelch misrepresentations of the city through advertising and promotion campaigns.

The survey indicates that it has considered previous surveys and studies. Some it takes issue with and others it modifies only slightly. It indicates that many plans have been made in the past, but were never put into effect. Thus, the area never benefited from such programs as were clear cut and well thought out, and this lack of initiative has been detrimental economically to the city.

Committee Endorses Wire Nail Subsidization

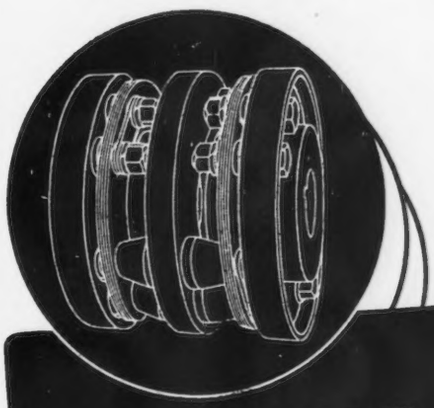
Washington

• • • **Expressing belief** that subsidization would increase the output of wire nails by approximately 15,000 tons monthly, the Steel Labor Advisory Committee has endorsed NHA's proposal to pay $20 a ton for production above set quotas.

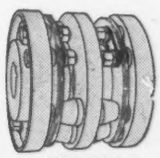
Details of the plan, first revealed exclusively in THE IRON AGE (Sept. 26, p 112), are now being smoothed out and the order readied for issuance about Oct. 25, it is further learned.

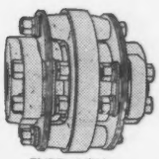
In approving the plan, labor representatives said the bonus payments would allow union men to work overtime under plant-by-plant arrangements to be arrived at by labor and management.

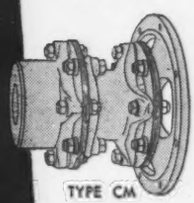
THOMAS
Flexible COUPLINGS
are specified by engineers wherever
100% dependability is demanded

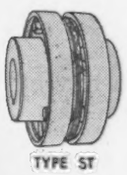


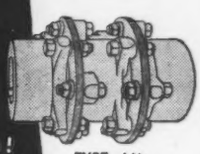
THOMAS
Flexible COUPLINGS
provide for
Angular and Parallel Misalignment as well as Free End Float . . .
and Eliminate
BACKLASH, FRICTION, WEAR and CROSS-PULL
NO LUBRICATION IS REQUIRED!


TYPE DBZ

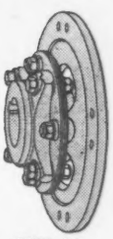

TYPE DSM

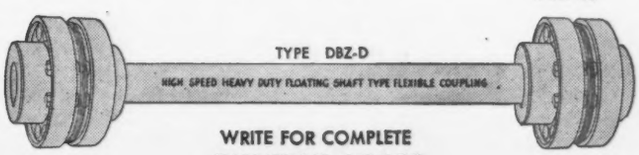

TYPE CM


TYPE ST


TYPE AM

The Thomas All-Metal Coupling does not depend on springs, gears, rubber or grids to drive. All power is transmitted by direct pull.


TYPE SS



WRITE FOR COMPLETE ENGINEERING CATALOG

THOMAS FLEXIBLE COUPLING CO.
WARREN, PENNSYLVANIA

London Economist

(CONTINUED FROM PAGE 103)

curity in what may be a question of life or death for a whole nation?

THE United States in its proposals to the Atomic Energy Commission has made an offer which can be modified by negotiation, but in principle represents the minimum of control required for protecting the world against atomic frenzy. The United States has offered to stop its production of atomic bombs, to destroy those already in stock and to join in an international prohibition pact, provided an effective system of inspection is set up to prevent violations of the pact and that the Great Power veto is not allowed to block action if either the inspection is obstructed or violation is discovered. This is fundamentally a reasonable offer from the nation which at present holds a monopoly of the weapon and it is in the real interest of all nations, especially of the smaller ones and those most vulnerable to atomic attack, that an effective international inspection should be organized. The opposition so far has come from Russia, which claims that international inspection would be an infringement of national sovereignty and that it will be quite good enough if every nation gives its word not to make or use atomic bombs.

The fact that the report of the scientific and technical committee of the commission has been unanimous suggests that Russia may not in the long run be as obdurate as appeared at the outset. Russia may be able to produce atomic bombs in the near future, but there is no reason to believe that an atomic armaments race (which would include the development of propellants and of all kinds of detector and interceptor devices as well as the improvement of the bomb itself) would work out to Russia's advantage. Russia has some excellent scientists and an exceptional capacity for concentrating industry on given objectives without regard to popular consumers' demand, but the last war did not show such eminence in science, technology and industrial organization as would justify Soviet military leaders in entering on an avoidable competition in applied physics.

The principal scientific advances of the last war did not originate in Russia, and Russia's victories were certainly not due to a qualitative superiority of armaments. The strongest Russian arm was the artillery, and the high reputation of Russian artillery goes back to Tsarist days. On the whole, it seems that Russia's advantage clearly lies in the exclusion of ultra-scientific weapons and the retention of established normal forms of military power in which the Russian position is already extremely strong. An atomic arms race would only be likely to turn to Russia's advantage if other nations could be persuaded to accept a pact without safeguards and to refrain from producing the bombs, while Russia went on secretly making them. It would be wrong to impute to Russia any such intention, but as long as Russia demands that the United States liquidate its atomic arsenals but itself refuses to agree to effective international inspection, such suspicions are bound to arise and to make the present holders of the bombs and their secrets determined to hold on to them.

It is very likely that the Russian objection to international inspection arises less from any specific view about atomic bombs than from Russian secretiveness as such. Secrecy in Russia was a habit verging on mania long before bolshevism; in the time of Nicholas I so many official papers were marked "most secret" that special marks had to be invented for documents which it really was important not to divulge, and contemporary Russia has carried secrecy to incredible lengths. Moreover, there are other things besides armaments which the Soviet State finds it expedient to conceal—such as the *lagier* system of Siberia which would be unpleasantly exposed if foreign inspectors could go where they pleased. For these reasons there is likely to be strong pressure in Moscow for a firm stand on national sovereignty and no Paul Prys on Soviet soil. Yet there have recently been some signs that the unanimity of opinion in ruling circles in Russia is not quite as monolithic as it should be in Communist theory,

ERIE SINGLE LINE BUCKETS

ILLUSTRATED is the hook-on type, for intermittent service. It is reeved and ready for operation on overhead traveling crane, monorail hoist, locomotive crane, derrick, ships tackle or any other hoisting device which has but a single hoisting drum available for bucket duty. Just slip the yoke over the crane hook.

Erie Single Line buckets are also available in the direct-reeved type for permanent installation. Describe your Single Line bucket need — we'll give you our recommendations for we build all types and sizes.

● *Write for Booklet 402*

ERIE BUCKETS • *A Complete Line*

Erie Steel Construction Co., 866 Geist Rd., Erie, Pa.

BUCKETS • AGGREMETERS • PORTABLE CONCRETE PLANTS

and it may be that if world opinion outside Russia is strongly aroused in favor of international atomic control with inspection, even the NKVD may be unable to keep out the influence, especially when the risks of the alternative are so great.

One step of great importance for disarming whatever genuine suspicions of an international inspectorate Russia may have would be to give the world commission of experts a status corresponding to the vast importance of their work. They should be carefully selected from all nations, permanent irremovable like English judges except on proved charges of maladministration, and provided with a special United Nations diplomatic status which would enable them to resist pressure from any quarter. In the last resort decisions would still have to be made politically by the governments in council, but the actual control and inspection must be in the hands of men commanding universal respect who are obviously above corruption, coercion or careerist axe-grinding and who do not regard their work as a temporary job.

Russia may be haunted by memories of endless repetitions of adverse majorities on commissions of the Paris conference and look askance at any atomic control commission with adequate powers as likely to be somehow an instrument of the capitalist West for restricting, undermining or humbling the Soviet Union. It must be made clear that an atomic control commission would not simply reflect the actual alignments of states, that it would be by its charter and composition a genuinely independent body in which humanity's aspiration for peace, transcending all frontiers and even divisions of ideology, could find expression. If the scientific and technical committee of the United Nations investigating the problem has declared that international control is workable technically, then politically the governments must see to it that such a control with adequate powers of inspection is set up. The attainment of this aim is of even greater importance than any treaty which may emerge from the peace conference in Paris or the future conferences which will have to deal with the affairs of Germany and Japan. Peace for our age must mean in the first place the taming of the atomic djinn.

Handling conditions vary for each particular plant. Your own problem should be presented to an experienced material handling engineer. However, the following example outlines a simple method for determining the savings possible with an electric industrial truck. Let us assume a hypothetical plant with the simple problem of transporting daily 180 tons of material 200 feet from stockrooms to processing machines. Without power trucks this would require 10 truckers, each making 10 round trips per hour, or 80 trips per day, carrying 450 lbs. of material per load.

TABLE I—*Handling Costs Without Electric Truck*

Based on 180 tons per day	*Cost per day*	*Cost per ton*
Labor (85¢ per hour)	$68.00	$0.378
Social Security Taxes	2.72	0.015
Workmen's Compensation	1.00	0.006
Hand Truck Depreciation	0.30	0.002
Total	$72.02	$0.401

In order to mechanize handling operations, the following equipment would be required:

TABLE II—*Cost of Equipment for Mechanizing*

Fork Lift Truck 2000-lb. capacity	$4,100.00
Battery	600.00
Charging Equipment	840.00
200 pallets	700.00
Total	$6,240.00

The truck, handling one-ton pallet loads of material, making 24 round trips per hour, could transport the 180 tons in 7½ hours.

TABLE III—*Annual Expense—Truck Operation*

Depreciation—Truck at 10%	$410.00
Battery at 20%	120.00
Charging equipment at 6⅔%	56.00
Pallets at 20%	140.00
Tires	100.00
Repair and Maintenance—Truck	164.00
Battery	24.00
Charging Equipment	33.60
Replacement of damaged pallets	70.00
Electricity	82.00
Insurance	10.00
Total annual expense	$1,209.60
Expense per day	4.03

TABLE IV—*Handling Costs—With Electric Truck*

Based on 180 tons per day	*Cost per day*	*Cost per ton*
Labor (Driver—$1 per hour)	$8.00	$0.044
Social Security Taxes	0.32	0.002
Workmen's Compensation	0.16	0.001
Truck Expense	4.03	0.022
Total	$12.51	$0.069

TABLE V—*Savings With Electric Truck*

Savings Per Ton	$ 0.332
Savings Per Day (Handling 180 tons)	59.51
Savings Per Year (300 days)	17,853.00
Per Cent Reduction in handling costs	83%
Annual earnings on investment	286%

While this example is obviously oversimplified, Baker Material Handling Engineers are prepared to show you how similar savings can be made on handling operations in your plant.

COST OF MATERIAL HANDLING

Per ton—based on 180 tons per day

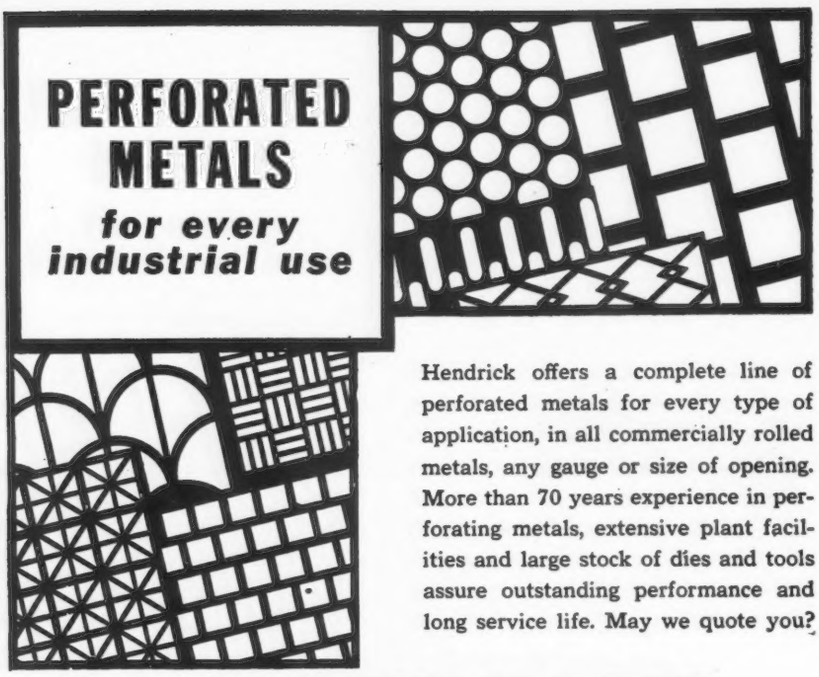
In addition to these savings, Baker Trucks reduce warehouse rental charges by tiering, contribute to plant safety, speed production and material movement, and perform many other operations that reduce plant overhead.

BAKER INDUSTRIAL TRUCK DIVISION *of The Baker-Raulang Company*

2172 WEST 25TH STREET • CLEVELAND, OHIO

In Canada: Railway and Power Engineering Corporation, Ltd.

Baker INDUSTRIAL TRUCKS



PERFORATED METALS

for every industrial use

Hendrick offers a complete line of perforated metals for every type of application, in all commercially rolled metals, any gauge or size of opening. More than 70 years experience in perforating metals, extensive plant facilities and large stock of dies and tools assure outstanding performance and long service life. May we quote you?

HENDRICK

Manufacturing Company

Perforated Metals
Perforated Metal Screens
Architectural Grilles
Mitco Open Steel Flooring,
"Shur-Site" Treads and
ARMORGRIDS

37 DUNDAFF STREET, CARBONDALE, PENNA.

Sales Offices In Principal Cities

CHILLED SHOT DIAMOND GRIT

Airless or centrifugal operating machines require Heat-Treated Shot or Heat-Treated Steel Grit.

The ordinary Shot and Grit will not do. They break down too fast and wear away quickly. In other words—expensive at any price.

Our Shot and Grit were made expressly for use in airless machines.

It simply means—
More cleaning at much less cost.
More cleaning and less dust at less cost.

And, remember—any old size won't do.

There is a correct size of Shot and Grit to obtain maximum results.

If cleaning grey iron, malleable iron, or steel drop forgings, we can save you money.

Let us prove it!

HARRISON ABRASIVE CORPORATION

Manchester, New Hampshire

Gallup Polls

(CONTINUED FROM PAGE 95)

gressional and Presidential election tests.

•

• • • **Although New York City** voting registration figures are the highest in history for any gubernatorial year, the Democrats can take little comfort from what this indicates as to the probable turnout for the nation in November.

Experience has shown a moving relationship between how many people register to vote in New York and how many voters turn out to vote throughout the entire country in the November elections. The relationship shows the city registration becoming constantly greater in relation to the total vote of the nation.

In 1934, 1,977,360 voters registered in New York. The turnout for the nation in November of that year was 32,487,865. The national vote was thus 16.4 times greater than New York registrations.

In 1938, the turnout throughout the nation was only 14.9 times greater than the New York registrations. In 1942, the national vote was only 13.1 times greater than the New York registrations.

Statisticians, taking into account a number of factors operating on the relationship of New York registrations to total vote, estimate that the total vote will this year be about 12.5 times larger than the New York registrations.

If the relationship as it has consistently obtained in the past holds good this year, it would indicate a total voter turnout in November of 34,000,000.

This would mean a total turnout this year running about 14,000,000 below the number who voted in the Presidential year of 1944.

It would be about 9,000,000 below what institute statisticians estimate could be considered a normal turnout for this year, taking into account population growth, the increase in eligible voters, etc. The normal turnout, statisticians say, would be approximately 43,000,000 if turnout trends in effect before the war continue.